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To Dr. J. C. Thompson
with compliments
of the author

Honolulu Hawaii
March 12/1928

Gerrit P. Wilder

N.B.
This belongs in the Library
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FRUITS

OF THE

HAWAIIAN ISLANDS

BY

GERRIT PARMILE WILDER

(Revised Edition, including Vol. 1, 1906.)

Illustrated by One Hundred and Twenty-One Half-Tone Plates with Descriptions of Same

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Gerrit Parmile Wilder

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PREFACE

My original intention with regard to this work, was to publish it in a series of three volumes; and to that end, the first volume was presented to the public in 1906.

Since that time, however, I have deemed it advisable, for various reasons, to incorporate all my data in one volume.

I desire to acknowledge my indebtedness for help in my researches, to various works on Horticulture, and to many of my personal friends who have given me valuable assistance.

I trust that this work will prove of some interest, as I believe that it contains a fairly comprehensive list of both the indigenous and naturalized Fruits of the Hawaiian Islands.

GERRIT PARMILE WILDER.

G. P. W. Collection. PLATE I

Persea gratissima.

AVOCADO, PALTA OR ALLIGATOR PEAR.

Grown in the garden of Gerrit Wilder.

PLATE I.—*Avocado.*

G. P. W. Collection. PLATE II

Persea gratissima.

AVOCADO.

This spreading evergreen tree is a native of Tropical America. In the Hawaiian Islands, the first trees of its kind were said to have been planted in Pauoa Valley, Oahu, by Don Marin. It attains a height of from 10 to 40 feet, and is adverse to drought. Its leaves are elliptico-oblong, from 4 to 7 inches in length. The flowers are greenish-yellow and downy. The fruit, which ripens from June until November, is a round or pear-shaped drupe, covered with a thin, rather tough skin, which is either green or purple in color. The flesh is yellow, firm and marrow-like, and has a delicious nutty flavor. The seed-cavity is generally large, containing one round or oblong seed, covered by a thin, brown, parchment-like skin. The quality of the pear is judged, not only by its flavor, but by the presence or absence of strings or fibre in the meat, and also by the quantity of flesh as compared to the size of the seed. Innumerable variations as to size, shape, and quality have been produced from seedlings—some of which may be seen in the accompanying illustration. The Avocado is easily reproduced by budding and grafting, and the best varieties may be obtained in this manner.

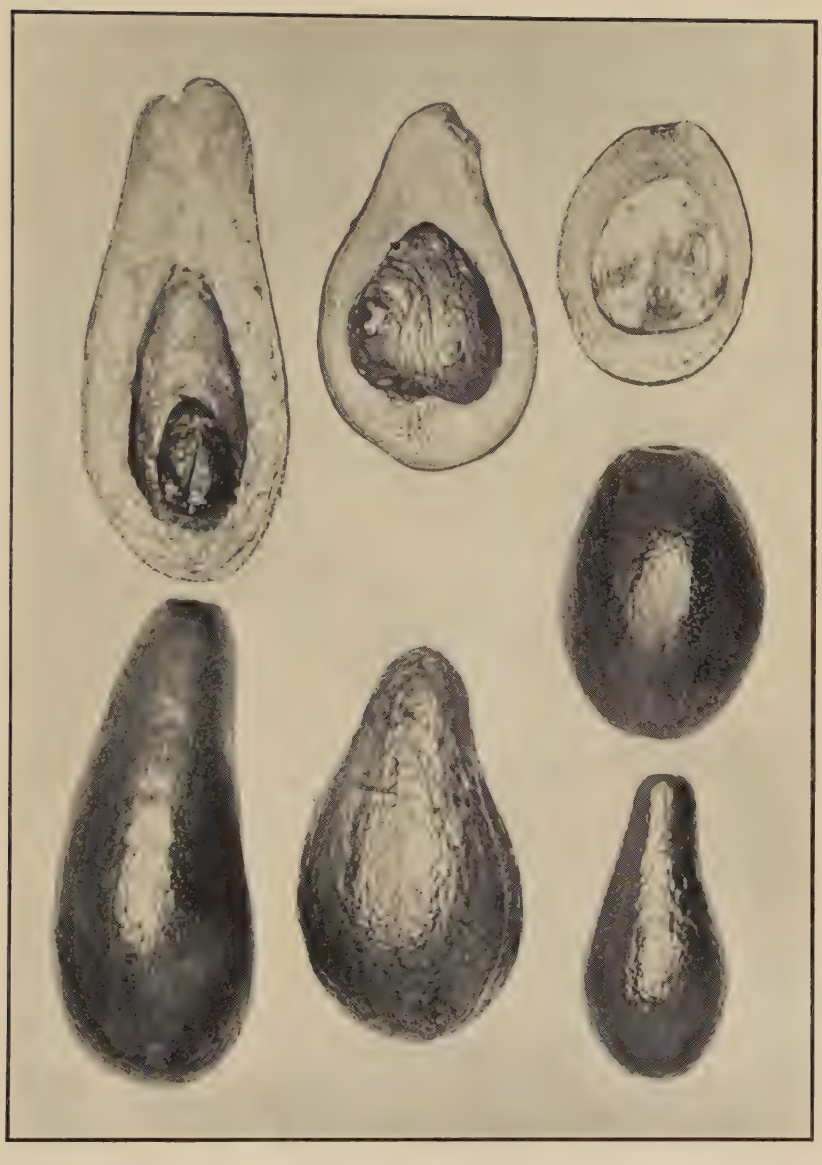

PLATE II.—*Avocado.*
One third natural size.

G. P. W. Collection. PLATE III

Persea gratissima.

GUATAMALA AVOCADO.

This variety is a native of Mexico, and although known as the Guatamala Avocado, it is more commonly to be found in the markets of the City of Mexico. Its leaves are purplish-green. The flowers, which appear in May and June, are like those of the preceding variety; and the drupe, which matures in the early part of the year, has a long stem. This fruit is round, from 3 to 5 inches in diameter, has a thick, tough, rough rind, which when ripe is a deep claret color, and the meat, which is a golden-yellow, is tinged with purple next to the rind, and is free from strings or fibres. There are but two trees of this variety bearing fruit in Honolulu. They were propagated from seeds brought here in 1890 by Admiral Beardsley. These two trees are growing in private gardens.

PLATE III.—*Avocado.*
One half natural size.

G. P. W. Collection. PLATE IV

Punica Granatum.

POMEGRANATE.

The name was derived from the word punicus, of Carthage, near which city it is said to have been discoveied; hence malum-punicum, Apple of Carthage, which was the early name of the Pomegranate. It is a native of Northern Africa, and of South-western Asia, and is grown in the Himalayas up to an elevtaion of 6000 feet. It is a deciduous shrub, which by careful training can be made to grow into a tree from 10 to 15 feet high. Many shoots spring from the base of the tree, and should be cut away, as they draw the sap which should go to the fruit-bearing stems The branches are slender, twiggy, nearly cylindrical, and somewhat thorny. The bark contains about 32 per cent. tannin, and is used for dying the yellow Morocco leather. The peel of the fruit serves also as a dye. There are several varieties of Pomegranate growing in Hawaii; the double-flowering variety is popular as an ornamental plant. All of the varieties are of easy culture, and are readily propagated by means of cuttings of the ripe wood. The leaves are lanceolate, glabrous, and a glossy-green with red veins. The flowers are axillary, solitary or in small clusters, and in color are a very showy rich orange-red. The fruit is about the size of an ordinary orange, has a persistent calyx, and is made up of many small compartments arranged in two series, one above the other. The crisp, sweet, watery pink pulp enveloping each seed is the edible portion of the Pomegranate.

PLATE IV.—*Pomegranate.*
One half natural size.

G. P. W. Collection. PLATE V

Ficus Carica (common variety).

FIG.

The Fig is the most ancient, as well as one of the most valuable of all fruit trees. Its name is nearly the same in all European languages. The tree is supposed to be a native of Caria in Asia Minor. The intelligent cultivators of Anatolia, by whom the Smyrna Figs are produced, adhere to the caprification process, used from time immemorial. In California, efforts have been made to test this process. In the Hawaiian Islands, the Portuguese seem to be the most ssuccessful cultivators of the Fig, and several varieties are to be found throughout the group. This common variety grows to a height of from 10 to 20 feet, is hardy, and can easily be propagated from cuttings. Its leaves are alternate, 3 to 5 deeply lobed ,and are shed during the fall months, at which season careful pruning will increase the following year's yield. The fruit is single, appearing from the axils of the leaves, on the new wood. It is a hollow, pear-shaped receptacle, containing many minute seeds, scattered throughout a soft, pinkish-white pulp.

PLATE V.—*Fig.*
One half natural size.

G. P. W. Collection. PLATE VI

Ficus Carica.

FIG.

Some years ago, this variety of Fig was to be found growing in large numbers at Makawao, and in the Kula district of Maui. Now, however, there are few, if any, trees remaining, as a destructive blight, together with the lack of proper attention, has caused their extermination. This variety is very prolific. The fruit is small, pear-shaped, and has a particularly sweet and delicious flavor.

PLATE VI.—*Fig.*

One half natural size

G. P. W. Collection. PLATE VII

Ficus Carica (white or lemon variety).

FIG.

This is a low-growing tree with compact foliage. The leaves are small, and the fruit is round-turbinate, about 1 to 1½ inches in diameter. The skin is very thin, is light-green in color, turning to a greenish-yellow when thoroughly ripe. The pulp is pink, very sweet, and when quite ripe is free from milky juice. This variety is also prolific, is easily dried, and on this account would find a ready sale in our markets.

PLATE VII.—*Fig.*

One half natural size.

G. P. W. Collection. PLATE VIII

Jambosa malaccensis.

MOUNTAIN APPLE, "OHIA AI."

This tree is found on all the large islands of the Polynesian groups, and in the Malaysian Archipelago. In the Hawaiian Islands it confines itself almost entirely to the moist, shady valleys, and thrives well, up to an elevation of 1800 feet. It is generally gregarious, and on the north side of East Maui it forms a forest belt. It attains a height of from 25 to 50 feet. Its dark, shiny, glabrous leaves are opposite, elliptico-oblong, and from 6 to 7 inches long, and from 2½ to 3 inches broad. The flowers are crimson, fluffy balls, appearing in March and April, on the naked branches and upper trunk of the tree. The fruit, which ripens from July until December, generally contains one seed, is obovate, about 3 inches in diameter. The skin is so thin as to be barely perceptible, and the fruit is very easily bruised. In color, it is a deep, rich crimson, shading into pink and white; the pulp is firm, white, and juicy, with a very agreeable flavor.

PLATE VIII.—*Mountain Apple.*

One third natural size.

G. P. W. Collection. PLATE IX

Jambosa sp. (Solomon Island variety).

WATER APPLE.

This low-growing tree is very rare in the Hawaiian Islands. It was introduced here, from the Solomon Islands, by Mr. A. Jaeger. The foliage and crimson flowers resemble those of the *Jambosa malaccensis,* but the drupe is not so highly colored, and is, in shape, much more elongated. Specimens of this sweet, edible fruit have measured 5 inches in length.

PLATE IX.—*Water Apple.*

One fourth natural size.

G. P. W. Collection. PLATE X

Jambosa sp. (white variety).

WATER APPLE.

This tree is a native of the Malay Islands. The foliage is symmetrical, and its opposite, shiny leaves are broad, lanceolate, and obtusely-acuminate. The pure white flowers, which bloom from March until June, are about ½-inch in diameter, and are produced in bunches on the naked branches. The fruit, which is also produced in bunches, ripens in October. It is transversely oval in shape, about 1 to 1½ inches in diameter at its largest end. It contains from 1 to 3 seeds. Even when quite ripe, the fruit remains pure white in color, and has a tart, insipid flavor.

PLATE X.—*Water Apple.*

One half natural size.

G. P. W. Collection. PLATE XI

Jambosa sp. (red variety).

WATER APPLE.

This low-growing tree with its bright evergreen foliage, is not common in Hawaii. The flowers are small, deep crimson, and appear on the branches either singly or in bunches. The contrast between these brilliant flowers and the fresh green leaves makes a very beautiful sight when the tree is in full bloom. The fruit, which ripens in July, appears in clusters; it is the same shape as that of the preceeding variety, but in color it is a bright scarlet. It contains from 1 to 3 seeds, which are somewhat difficult to germinate. The fruit is crisp, watery, and has a sub-acid flavor.

PLATE XI.—*Water Apple.*

One third natural

G. P. W. Collection. PLATE XII

Eugenia Jambos.

ROSE APPLE.

This evergreen tree, which is a native of the West Indies, is of medium size, reaching a height of from 20 to 30 feet. It grows well in Hawaii, and is found at an elevation of 2000 feet. It is propagated from seed, as well as from cuttings of the ripe wood. The leaves are lanceolate, acuminate, thick and shiny. The large, fluffy flowers which appear from January until April, are produced freely, and are a beautiful creamy-white. The fruit is a somewhat compressed, globular shell, varying in size from 1 to 2 inches in diameter, and with a large cavity, containing generally one seed. This shell, which is the edible portion of the fruit, is a light creamy-yellow, with a tinge of pale-pink on one side; it requires from 2 to 2½ months to mature. It is firm, crisp, and has a delicious flavor, somewhat resembling an apricot, and with a rose odor. The season for the fruit varies according to the elevation, but generally ends about August or September.

PLATE XII.—*Rose Apple.*

One half natural size.

G. P. W. Collection. PLATE XIII

Eugenia brasiliensis.

BRAZILIAN PLUM, OR SPANISH CHERRY.

This evergreen shrub, or low-growing tree, which in many countries is said to reach a height of but 6 feet, in Hawaii attains a height of 20 feet; and although it thrives in comparatively high altitudes, it bears best below the 200-foot elevation, and requires considerable moisture. The bluntish, dark, shiny leaves, which are scale-like along the branches, are obovate, oblong, and about 3 inches in length. The blossoming season varies according to the location; however, the tree generally has flowers and fruit from July until December. The fruit is the size of a cherry, is deep purple in color, and the persistent calyx is very prominent. The sweet pulp has a very agreeable flavor.

Probably the first plants of this variety were brought here by Don Marin, about a century ago. Some fine trees may be found in Pauoa and Makiki valleys, and also in Nuuanu, in the garden which formerly belonged to Dr. Hillebrand.

PLATE XIII.—*Brazilian Plum, or Spanish Cherry.*

One half natural size.

G. P. W. Collection. PLATE XIV

Eugenia uniflora.

FRENCH CHERRY.

This shrub is said to be a native of Brazil. In Hawaii, it is a common garden plant, sometimes reaching a height of 10 feet. Its glossy leaves are ovate-lanceolate, and its peduncles short. It has small, single, white fragrant flowers. The mature fruit, which resembles a cherry, is about 1 inch in diameter, and is ribbed longitudinally. It has a delicious, spicy, acid flavor. There is generally one large, round, smooth seed.

PLATE XIV.—*French Cherry.*
One third natural size.

G. P. W. Collection. PLATE XV

Eugenia sp.

This is a small Malayan tree which is rare in Hawaii. It has regular, opposite, large, broad leaves; with the stems and branches four-sided. The purplish-white flowers are produced in clusters. The waxy light-green fruits, with a persistent calyx, resemble a small guava. These fruits have a very tough, pithy skin and pulp combined, which is edible, but too dry to be agreeable. The seed is large in proportion to the size of the fruit.

PLATE XV.—*Eugenia sp.*

One half natural size.

G. P. W. Collection. PLATE XVI

Syzygium Jambolana.

JAVA PLUM.

This tall, hardy tree is a native of Southern Asia. In Polynesia it grows well, up to an elevation of 5000 feet. It is a very common tree in the Hawaiian Islands. Its leaves, which are from 4 to 6 inches long, and from 2 to 3 inches broad, are opposite, obtuse or shortly-acuminate. The flowers, which bloom in June, July and August, are white and quite fragrant, and are especially attractive to the honey-bee. The oblong fruit grows in large clusters, ripens from September until November, and varies in size from a cherry to a pigeon's egg. It is purplish-black in color, and is edible only when thoroughly ripe. It contains one large, oblong seed.

PLATE XVI.—*Java Plum.*

One half size.

G. P. W. Collection. PLATE XVII

Syzygium Jambolana (small variety).

JAVA PLUM.

This tree, which is also very common in the Hawaiian Islands, is said to have been introduced by Dr. Hillebrand. It bears but one crop a year, will grow in any sosil, and withstands dry weather. The foliage is smaller than that of the preceeding variety; its leaves are narrower, and a lighter green in color. It blooms at about the same time of year, but its flowers are not as large, and appear in thick bunches. The purplish fruit ripens from September until December .

PLATE XVII.— *Java Plum.*

One half natural size.

G. P. W. Collection. PLATE XVIII

Averrhoa Carambola.

This tree, which is said to have been named after Averrhoes, an Arabian physician, is a native of Insular India, and is much cultivated in India and China. It is evergreen, with dense foliage, and grows to a height of from 15 to 20 feet. It is easily propagated from seeds, and fruits in about three years. In Hawaii it bears one crop annually, the flowers appearing in July and the fruit in November and December. The leaves are alternate, odd-pinnate. The flowers, which are borne in clusters on the naked stems and branches, are minute, fragrant, and in color shading from a pale pink to a deep purplish-red. The fruit, varying in size from a hen's egg to an orange, is ovate, and has five acutely-angled longitudinal ribs. The fragrant, light-yellow skin is very thin, and the pulp is watery; it contains a number of flat, brown seeds. This fruit is of two varieties: the sweet, which may be eaten raw, and the acid which is delicious when preserved. A very appetizing pickle may be made from the half-ripe fruit of the acid variety.

PLATE XVIII. *Averrhoa Carambola.*

One half natural size.

G. P. W. Collection. PLATE XIX

Achras Sapota.

SAPODILLA, OR NASEBERRY.

This tree, which grows on almost all of the Islands of the Hawaiian group, is a fine evergreen, growing to a height of from 10 to 20 feet, and producing a fruit which is much prized in warm countries. The bark possesses tonic properties, and from the juice chewing-gum is made. Its foliage is dense, and the shiny leaves are thick, lance-oblong, entire, and clustered at the ends of the branches. The flowers, which are small, whitish, and perfect, are borne on the rusty pubescent growths of the season. The fruit, of which there are two varieties, the round and the oblong, is about the size of a hen's egg. It has a rough skin, the color of a russet apple, beneath which is a firm, somewhat stringy, sweet pulp, having the flavor of an apricot. This pulp is divided into 10 to 12 compartments, and contains from 4 to 6 large, flat, smooth, black seeds.

PLATE XIX.—*Sapodilla, or Naseberry.*

One half natural size.

G. P. W. Collection. PLATE XX

Casimiroa edulis.

WHITE SAPOTA.

This tree, which is a native of Mexico, is said to have been named after Cardinal Casimiro Gomez. The first tree of its kind in Hawaii was planted in 1884, at the Government Nursery, Honolulu. The seed came from Santa Barbara, California, where there grows today, a tree more than eighty years old, and which still bears its fruit. It is a tall evergreen with irregular branches; its digitate leaves are dark and glossy. The trunk is ashen-grey, with warty excrescences. The fruit, which matures in April and May, is large, 1 to 4 inches in diameter; it is depressed-globular and somewhat ribbed, like a tomato; in color it is a light-green, turning to a dull yellow when ripe, and it has a very thin skin. The pulp is yellow, resembling that of an over-ripe papaia, and has a melting, peach-like flavor. It contains from 1 to 3 large, oblong seeds, which are said to be deleterious.

PLATE XX.—*White Sapota.*

One fourth natural size.

G. P. W. Collection. PLATE XXI

Prunus Persica.

PEACH.

The Peach-tree is said by some authorities to be indigenous to Persia, while by others it is claimed to be a native of China. It is a hardy tree, and has been known to bear fruit precociously even in the second year after planting. If allowed to do so, the Peach will grow to a height of about 15 feet; but it should be pruned annually, in order to secure a good crop. Its leaves are lanceolate and coarsely serrate. The flowers are solitary, pink in color, and appear before the leaves. The fruit is soft and pubescent at maturity. The stone is deeply pitted and very hard. There are two well-marked varieties, the cling-stone and the free-stone.

Ulupalakua and Makawao, Maui, once had the reputation of growing finely-flavored seedling peaches; however, many of these trees have been injured by cattle, and others have been destroyed by root-fungus and insect pests. In several localities in Hawaii good peaches have been grown from imported varieties.

PLATE XXI.—*Peach.*

One half natural size.

G. P. W. Collection. PLATE XXII

Chrysophyllum Cainito (purple variety).

STAR APPLE.

This tree is a native of the West Indies, and although not common in Hawaii, there are good specimens to be found in many gardens. It has large irregular spreading branches, grows to a height of from 10 to 25 feet, and has rather thick foliage. Propagation is ordinarily effected by seeds, which germinate readily, when fresh. It can also be grown from cuttings of the ripe wood. The tree derives its name from the words "chrysos," gold, and "phyllon," a leaf; referring to the golden-russet color of the under-side of the beautiful, glossy green leaves. The small flowers, which appear from June until October, are solitary at the nodes or in fascicles. The fruit, which ripens in April, is round, about 3 inches in diameter, has a smooth, tough rind, about 1-16 inch thick, which is a deep purple in color. A cross-section of the fruit shows the edible pulp with its numerous black seeds, and the star-shaped core, from which the fruit derives its common name of Star Apple. Unless the fruit is thoroughly ripe, its milky juice is remarkably astringent.

PLATE XXII.—*Star Apple.*

One half natural size.

G. P. W. Collection. PLATE XXIII

Chrysophyllum Cainito (white variety).

STAR APPLE.

This tree, which bears its fruit in from four to five years, has about the same characteristics as that of the preceding variety. The fruit is somewhat larger, and is not quite so sweet. In color it is pale green, shaded with purple.

PLATE XXIII.—*Star Apple.*
One half natural size.

G. P. W. Collection. PLATE XXIV

Chrysophyllum monopyrenum.

This small tree, which is indigenous to the West Indies, is also a native of Southern Florida, and is to be found as an ornamental plant in many localities of tropical America. In Jamaica it is called the "Damson Plum." Its samll, single, white flowers are highly perfumed. The fruit, which matures from August until December, is small, ovoid-oblong, and when ripe is purplish-black; when bruised it emits a white, sticky juice. It contains one large seed. Specimens of this tree are to be found growing in the grounds of the Queen's Hospital and at the Government Nursery, Honolulu.

PLATE XXIV.—*Chrysophyllum monopyrenum.*

One half natural size.

G. P. W. Collection. PLATE XXV

Mimusops Elengi.

This handsome evergreen tree, with its bright, glossy leaves, is very suitable for hedges and for windbreaks. It has alternate, elliptic leaves 3 to 3½ inches long. The small, solitary flowers, have many creamy-white petals, and are very fragrant; from them perfume is obtained by distillation. The yellow fruit is about the shape and size of a small olive, and contains a dry, mealy pulp which is edible, and the large, flat, brown seed yield an oil.

PLATE XXV.—*Mimusops Elengi.*
One half natural size.

G. P. W. Collection. PLATE XXVI

Spondias dulcis.

"WI."

This deciduous tree is said to be a native of the Society Islands, and is common to the tropics of both hemispheres. It is a large, spreading and graceful tree, reaching a height of from 30 to 50 feet. Its pinnate leaves are green and glossy; the leaflets are oval-oblong and opposite. The foliage is shed from December until April. The flowers are paniculate, small, and greenish-white. The fruit, which ripens from November until April, is a fleshy drupe, oval in shape, from 1 to 3 inches in diameter; it has a thin, smooth, golden-yellow skin, which has a rather sour disagreeable odor. The fleshy pulp is light yellow, is mellow when quite ripe, and has a sub-acid delicious flavor, compared by some to the pineapple. Within this pulp is embedded a 1 to 5 loculed, bony endocarp, which contains generally one seed. This endocarp is covered with fibres which penetrate the pulp. The first Wi tree in Hawaii was planted at the residence of Mr. John S. Walker, Nuuanu Valley.

PLATE XXVI.—*Spondias dulcis.*

One third natural size.

G. P. W. Collection. PLATE XXVII

Spondias lutea.

HOG PLUM.

This tree is distributed over Tropical America, West Africa and Java, where it is commonly called the Hog Plum, and is used for fattening swine. In Jamaica it grows well, up to an elevation of 4000 feet. It is a large, graceful tree, about 50 feet high, with spreading branches, and it is particularly beautiful when in fruit. The pinnate leaves are a clear green, the leaflets are ovate-lanceolate, and the golden-yellow fruit hangs in clusters. It ripens in September and October. The fruit is ovoid, about 1 inch long; it has a smooth skin, having a disagreeable odor. There is one large seed, which resembles the husk of a ground-nut. This fruit is cooling and aromatic. To my knowledge there are but two trees of this kind in bearing in the Hawaiian Islands, and these are growing in private grounds in Honolulu.

PLATE XXVII.—*Hog Plum.*

One half natural size.

G. P. W. Collection. PLATE XXVIII

Mammea Americana.

MAMMEE APPLE.

The Mammee Apple, which grows well in Hawaii, is a native of the West Indies, and is a fruit much esteemed in tropical countries. In Jamaica it thrives well, up to an elevation of 3000 feet. The tree attains a height of from 30 to 40 feet, and the wood, which is beautifully grained, is durable and well adapted to building purposes. Its leaves are rigid and leathery. The round seeds, varying in number from 1 to 4, germinate freely, and the young plants are easily raised. The fruit is from 3 to 6 inches in diameter, is brown or russet color, and has a yellow pulp, which is sweet and aromatic. The outer rind, as well as the pulp immediately surrounding the seeds, is very bitter. The fruit may be eaten raw, and is very delicious when preserved.

PLATE XXVIII.—*Mammee Apple.*
One fourth natural size.

G. P. W. Collection. PLATE XXIX

Tamarindus indica.

TAMARIND.

The name is derived from Tamar, Arabic for Date, and Indus, Indian; thus literally meaning Indian Date. It is a native of the Indies, Egypt and Arabia. The tree is never leafless, and the foliage is graceful, pinnated and acacia like. It bears one crop a year, the season varying somewhat according to the location and elevation. It yields a handsome, hard and close-grained furniture wood, which is yellowish-white, with occasional red streaks in it; the heart-wood is dark brownish-purple. The pods are thick, linear, dark brown in color, and from 3 to 6 inches long. The seeds vary in number. The pulp surrounding the seeds has a pleasant acid flavor, and when made into syrup, forms the basis of a delicious, cooling beverage. This pulp is called the fruit, while the pod is spoken of as the shell. The Tamarind is propagated from both seeds and cuttings, and is undoubtedly one of the noblest of our tropical trees.

PLATE XXIX.—*Tamarind.*

One half natural size.

G. P. W. Collection. PLATE XXX

Durio zibethinus.

DURION.

This fine tree attains a height of from 60 to 80 feet; it derives its name from the Malay word "dury," a thorn, in reference to the prickly covering of the fruit. The leaves, which are a light, glossy green on the upper surface, are alternate, entire, elliptical and acute. The yellowish-white flowers are large. The fruit, which is either globular or oval, sometimes measures 10 inches in length. It has a hard rind, covered with thorny warts or spines, and externally looks not unlike a breadfruit. When ripe, it is brownish-yellow, and, when opened at its lower end, shows five longitudinal sections or cells, each containing from 1 to 4 seeds about the size of a pigeon's egg. The edible pulp surrounding the seeds is firm and cream-colored. The Durion is remarkable for its combination of an absolutely delicious flavor and an abominably offensive odor. To my knowledge there is but one tree in bearing in the Hawaiian Islands, and that is growing in private grounds at Lihue, Kauai.

PLATE XXX.—*Durion.*

One third natural size.

G. P. W. Collection. PLATE XXXI

Coffea arabica.

ARABIAN COFFEE.

The Coffee-tree is said to be a native of Abyssinia. Two species, the Arabian and the Liberian, are now cultivated throughout the tropics. The use of coffee was known in Arabia long before it was introduced to Europeans in the sixteenth century. The Dutch were the first to introduce the plant to Europe. The Arabian Coffee-tree is low-growing, and bears one crop annually; its laves are elliptico-oblong, acuminate, generally from 3 to 6 inches long, and are thin and shiny. The white flowers appear in clusters, and are very fragrant. The berries are ovoid, fleshy, and bright red. In this berry are found the two seeds, which constitute the coffee of commerce. The Coffee-tree was introduced into Hawaii about 1823, by a Frenchman, whos established a small plantation in Manoa Valley, Oahu. The tree is now well naturalized in the woods of Kona, Hawaii, and elsewhere in the Islands, and flourishes up to an elevation of from 1000 to 2000 feet.

PLATE XXXI.—*Arabian Coffee.*

One half natural size.

G. P. W. Collection. PLATE XXXII

Coffea liberica.

LIBERIAN COFFEE.

This species is a tall grower, is highly ornamental in foliage, and is a rich bearer. Its leaves are from 6 to 12 inches long. The white flowers come in dense clusters, and are more robust and productive than are those of the Arabica. The berries are nearly spherical, and in color are a dull crimson. The pulp is large in proportion to the size of the seeds. Although this variety has not become popular in Hawaii, it is claimed that it will grow at a much lower elevation than will the Arabica, and the flavor is said to be very fine.

PLATE XXXII.—*Liberian Coffee.*

One half natural size.

G. P. W. Collection. PLATE XXXIII

Clausena Wampi.

WAMPI.

This odorous tree is a native of China. It is a symmetrical evergreen with dense foliage. The light, mossy-green leaves are imparipinnate, the leaflets ovate-repand, and they are rough on the under surface. The flowers, which are borne in clusters, on the new wood, are small, yellow, and very fragrant. The fruit ripens from June until October; it is about the size of a gooseberry; the skin is yellowish-brown, shaded with green. The pulp is sub-acid with a balsamic fragrance. It contains one large seed about the size of a kernel of corn. There are two varieties, the sweet and the sour; both may be eaten raw, and are very highly prized by the Chinese. I know of but two trees of this kind in the Hawaiian Islands; they are of the sour variety, and are growing in private gardens in Honolulu.

PLATE XXXIII — *Wampi.*

One half natural size.

G. P. W. Collection. PLATE XXXIV

Physalis peruviana.

CAPE GOOSEBERRY—"POHA."

This shrub, or bush, is a native of Brazil, but is naturalized in many warm countries. It stands partially erect, reaching a height of from 1½ to 3 feet. Its pointed leaves, heart-shaped at the base, are very fuzzy. The open, bell-shaped flowers are yellow in color. The fruit, which is about the size of a cherry, is enclosed in a thin, yellow, paper-like husk, which is quite hairy. When ripe, the fruit is yellow, and has a delicious sub-acid pulp, filled with minute seeds. The Poha may be eaten raw, but is much more acceptable when made into jam or jelly. The dried fruit is said to be a substitute for yeast. In Hawaii, the Poha thrives best in the cool elevations.

PLATE XXXIV.—*Cape Gooseberry.*

One third natural size.

G. P. W. Collection. PLATE XXXV

Carica Papaya.

PAPAIA (fruit, female tree).

The Papaia is a native of South America; it is found in Florida, and in many parts of tropical America; it was early introduced into Hawaii, grows and bears well in almost any locality. It is a small tree, with a hollow, branchless trunk; it is short-lived, and is suitable only to regions free from frost, and requires perfect drainage. There are two forms, the tall and the dwarf, but there are numerous variations as to shape and quality of the fruit. The soft green leaves, often measuring two feet across, are variously palmated, and have simple, long, hollow stems. The Papaya is usually dioceous; the fruit-bearing tree is called the female; it is claimed that trees of both sexes should be planted near each other, in order to ensure a good yield. The female flowers, which appear from the axils of the leaves, are yellowish-white, single, or two or three together.

The fruit of the Papaya ripens successively. It is either round or oblong, and sometimes weighs eight pounds. The skin is thin, and is bright yellow when ripe. The firm, yellow pulp has a delicious flavor, and the milky juice contains a digestive principle similar to pepsin. The seed cavity is large, and is filled with many small seeds which are enveloped in a loose, mucous coat, with a brittle, pitted testa. When fresh these seeds germinate readily.

PLATE XXXV.—*Papaia* (*fruit, female tree*).

One fourth natural size.

G. P. W. Collection. PLATE XXXVI

Carica Papaya.

PAPAIA (fruit, male tree).

The size, shape, foliage and general appearance of this tree is the same as that of the preceding variety. Its flowers appear on long stems, are funnel-shape, and have five lobes. The male tree sometimes produces fruit, and it is of large size and fine quality. A good example may be seen in the accompanying illustration.

I know of no method whereby one can, by any selection of seeds, produce with any degree of certainty, plants of either male or female variety.

PLATE XXXVI.—*Papaia* (*fruit, male tree.*)

One third natural size.

G. P. W. Collection. PLATE XXXVII

Carica quercifolia.

This species of dwarf Papaya is of recent introduction to Hawaii. It has a soft, hollow trunk, and low, spreading branches. The leaves are deeply lobed, of a light green color on the upper side, and whitish-green underneath. Flowers dioecious, yellowish-green, having five petals. Fruit the size of a large olive, green, and ribbed with five white stripes, changing to yellow when ripe. The yellow pulp, containing numerous seeds, has a strong pesin flavor that is quite agreeable.

PLATE XXXVII.—*Carica quercifolia.*

One third natural size.

G. P. W. Collection. PLATE XXXVIII

Citrus Japonica.

Var. "Hazara."

CHINESE ORANGE.

This familiar and highly ornamental tree, commonly known as the Chinese orange, was very early introduced to these Islands. It is well named Hazara (meaning thousand of fruit), as it is one of the most prolific of the citrus family, and both green and ripe fruit in great quantities may be found on the same tree at almost any season of the year. The tree is of medium size, and the small, shiny leaves have short petioles. It is generaly thornless. The flowers are white and fragrant. The round fruit is a deep yellow, and its smooth skin is very loosely attached. The pulp is also a deep yellow and contains many seeds, and the sour juice is very plentiful. The tree is hardy and free from disease and scale. Propagation is by seed.

PLATE XXXVIII.—Chinese Orange.
One half natural size.

G. P. W. Collection. PLATE XXXIX

Citrus Japonica.

KUMQUAT.

The Kumquat is a native of Cochin-China, and is also cultivated in Japan, Florida, and California. It is a low-growing bush or shrub, having smooth, angular branches, and in both the round and oval varieties the dark foliage is dense and beautiful. It is a very prolific bearer. Its leaves are small, lanceolate, slightly serrate, pointed or blunt and wedge-shaped at the base. The small, white flowers come solitary or in clusters, the fruit varies in size from a large gooseberry to that of a pigeon's egg, and is either ovate, oblong, or spherical. It is 5 to 6 celled, has very little pulp, and contains many seeds. The pulp is somewhat sour, especially in the round varieties; and the smooth, thick, yellow rind is aromatic and sweet; the Kumquat is generally preserved whole, and those prepared by the Chinese are very delicious.

This ornamental citrus tree is not often seen in our gardens, for it is subject to scale, and to the mealy bug, which destroy the flowers and stunt the fruit. The Kumquat comes true to seed, and may also be propagated by grafting and budding.

PLATE XXXIX.—*Kumquat.*

Two thirds natural size.

G. P. W. Collection. PLATE XL

Citrus Nobilis.

MANDARIN ORANGE.

This small tree or thornless shrub with its dense foliage is a native of Cochin-China, and fine specimens of this tree, with its golden fruit in season, can be found in many gardens about Honolulu, especially those of the Chinese. Its leaves are lanceolate, its petioles short. Flowers are white and fragrant. The fruit is compressed-spherical, apex depressed, a ridge about the stem. The thin peel is greenish-yellow, baggy, and separates readily from the sections. Pulp generally dry, sweet, juice scant, fruit containing many seeds. The characteristic odor of the leaves, twigs and fruit of all varieties of the Mandarin orange is easily recognizable.

PLATE XL.—*Mandarin Orange.*

Two thirds natural size.

G. P. W. Collection. PLATE XLI

Citrus medica limetta.

LIMES.

This small tree or bush thrives in Hawaii, and yields good crops. It requires a sandy, rocky soil, and does well in the shaded valleys. However, it is attacked by scale pests and root fungus, and many valuable trees are destroyed in this way. The dark green, shiny leaves are oval or elliptical, and emit an agreeable odor when bruised. The fragrant flowers are small, white, with an occasional tinge of pink. The fruit is small, varying in shape from round to elliptical. The light yellow skin is oily and very bitter, and the pulp is juicy and sour. The picture representing this fruit shows several varieties, forms and shapes; those on the left being the Mexican type, those on the upper right the Kusai lime, the latter much resembling a mandarin orange in shape, and has a loose skin, but the pulp is very juicy and exceedingly sour. This lime has become very popular in Hawaii, grows readily from seed, and produces true. To Mr. Henry Swinton is due the credit of introducing this variety in 1885 from Kusai, or Strong's Island, Micronesia.

PLATE XLI.—*Limes.*

One half natural size.

G. P. W. Collection. PLATE XLII

Citrus medica limonum.

LEMON..

This is a spreading tree, having ovate-oblong, fragrant leaves with short petioles. The flowers are small and white. The medium-sized fruit is egg-shaped, ending in a nipple-like point. The thin, smooth skin is aromatic. The juicy pulp is rich in citric acid. Many choice varieties of lemons have been introduced to Hawaii, but they have not thrived particularly well, because of the scale and insect pests which so greedily attack them; eternal vigilance is necessary in order to get the fruit matured; some very fine specimens, however, have been grown in Kona, at an elevation of 1500 feet.

PLATE XLII.—*Lemon.*

One half natural size.

U. P. W. Collection. PLATE XLIII

Citrus medica var. limonum.

ROUGH-SKIN LEMON.

This variety is very hardy, bears profusely, and requires much more water than does the orange. Being a strong, vigorous grower, it forms an excellent stock upon which to graft the citrus varieties. The flower is white, with a reddish tint outside. The fruit is generally oval, and contains many seeds. The pale yellow skin is rough and warty. The pulp is coarse-grained and very juicy. It comes true to seed.

PLATE XLIII.— *Rough-skin Lemon.*

One half natural size.

G. P. W. Collection. PLATE XLIV

Citrus Aurantium Sinense.

WAIALUA ORANGE.

This tree, which grows to a height of from 20 to 35 feet, is cultivated in all tropical and sub-tropical countries. Its young branches are pale green, angular and glabrous. The leaves are oblong, ovate and pointed, and the petioles are narrowly winged. Its flowers are white and very fragrant. This variety of orange, locally known as the Waialua orange, has a bright yellow fruit, generally round, with a coarse, thick skin, very juicy pulp, and numerous seeds; and was introduced by Vancouver and planted in Hanalei valley, Kauai. It is now widely disseminated throughout the group, and in Kona, Hawaii, grows exceptionally well. This orange is said to produce true to seed.

PLATE XLIV.—*Waialua Orange.*

One half natural size.

G. P. W. Collection. PLATE XLV

Citrus Aurantium.

BAHIA, OR WASHINGTON NAVEL.

This variety was first introduced into the United States from Brazil, and is now the most popular of all the oranges. It is cultivated extensively in California, in which State the first trees of its kind were planted; for this reason it is often called the Riverside Navel. The fruit is large, solid, and heavy. It is seedless, and has a prominent navel mark at the apex. The brilliant orange color of the skin is one of its characteristics. Grafted and budded trees of this variety of orange may be found growing in many localities in the Hawaiian Islands, but the fruit is not as fine as it should be, as, with few exceptions, it has a tendency to become very dry and woody.

PLATE XLV.—*Bahia, or Washington Navel Orange.*

One half natural size.

G. P. W. Collection. PLATE XLVI

Citrus Decumana.

POMELO OR SHADDOCK (pear-shaped var.).

This hardy tree, with its spreading branches, grows to a height of from 15 to 20 feet. It is extensively cultivated in India, and widely distributed over the Malayan and Polynesian Islands. It was early introduced to the Hawaiian Islands, presumably by the Chinese, who seem to be especially fond of the fruit, as it is always an important feature of their New Year's decorations. The leaves are large, oval or ovate-oblong, obtuse, and frequently emarginate, and the petiole is broadly winged. The flowers are large and white. This pyriform variety, which is from 6 to 8 inches in diameter, often weighs 4 to 8 pounds.

The pale-yellow rind is smooth, thick and very bitter, but can be made into a preserve. The pulp varies in color from pale yellow to red, and has a sub-acid, slightly bitter, flavor.

PLATE XLVI.—*Pomelo or Shaddock (pear-shaped var.)*

One third natural size.

G. P. W. Collection. PLATE XLVII

Citrus Decumana.

POMELO OR SHADDOCK (round var.)

The fruit of this round variety is smaller than that of the preceding variety. The light-yellow rind is coarse, spongy, thick, and leathery. The cells of the pulp are coarse, dry, and have a bitter, sub-acid flavor. There are many large, wedge-shaped seeds.

PLATE XLVII.—*Pomelo or Shaddock* (*round var.*)
One third natural size.

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G. P. W. Collection. PLATE XLVIII

Artocarpus incisa.

BREADFRUIT (Hawaiian var.)

"ULU."

The first breadfruit trees were brought from Tahiti by the Hawaiians who, landing at Ewa, carried them across the mountain, and presented them to one of the Chiefs of Oahu, who lived at Kualoa. There they were planted and thrived. At the present day this variety of the breadfruit, now called the Hawaiian variety, is to be found growing wild throughout the Islands. There are many varieties of this handsome tree, which grows to a height of from 15 to 40 feet. It thrives best in hot, moist places, and requires a great deal of water.

Its large ovate leaves are rough and deeply lobed. The male flower is a large yellow catkin. The fruit is formed from the female flowers, and is attached to the branches by large stems. In shape it is either round or oblong, varying in size from 5 to 8 inches in diameter. The thick, tough rind is, in some varieties muricated, and in others it is reticulated. In color it is green, changing to brownish when the fruit is ripe. The pulp is firm, mealy, and somewhat fibrous, and as an article of diet is much esteemed. Propagation is by suckers, or by layers from the branches.

PLATE XLVIII.—*Breadfruit (Hawaiian var.)*—"*Ulu.*"
One third natural size.

G. P. W. Collection. PLATE XLIX

Artocarpus incisa.

BREADFRUIT (Samoan var.)

This variety was introduced to these Islands by Mr. James Bicknell. Its large, oval leaves are leathery and rough, and less deeply lobed than are those of the Hawaiian variety. The round fruit has a characteristic raised ring where it is attached to the long stem. The yellowish-green rind is reticulated, and the orange-colored pulp is somewhat sticky when cooked, and is very sweet. This variety occasionally produces seed.

PLATE XLIX.—*Breadfruit (Samoan var.)*

One half natural size.

G. P. W. Collection. PLATE L

Artocarpus incisa.

BREADFRUIT (Tahitian var.)

This variety of Tahitian breadfruit is found only in a few gardens in Hawaii. Its glossy green leaves are nearly entire. The oblong fruit has a deep yellow pulp, with very little fibre.

PLATE L.—*Breadfruit (Tahitian var.)*

One half natural size.

G. P. W. Collection. PLATE LI

Artocarpus incisa.

FERTILE BREADFRUIT.

This seeding variety is rarely cultivated on account of its inferior fruit. The leaves are slightly lobed. The fruit is oblong with a short, thick stem, and is covered with short, hard projections. The fibrous pulp contains numerous large seeds, which are edible when cooked.

PLATE LI.—*Fertile Breadfruit.*
One third natural size.

G. P. W. Collection. PLATE LII

Artocarpus integrifolia.

JACK FRUIT.

This tree is a native of India and Malay. And was introduced to Hawaii by Mr. David Forbes of Kukuihaele, Hawaii. The Jack fruit is a large, handsome tree, with leaves from 4 to 6 inches in length, which on the old growth are obovate-oblong and on the young branches are narrow. The oblong, irregular fruit, which varies in weight from 20 to 60 pounds, is borne on the trunk, as well as on the old branches. The green rind is covered with small hexagonal knobs. The pulp when ripe has an overpowering odor and is seldom eaten; but the oily seeds when roasted are edible, and are said to resemble chestnuts. On Tantalus, Oahu, the Jack fruit thrives well, and has produced fair sized fruits. It is a tree that needs a great deal of moisture, and consequently is seldom grown on the low lands.

PLATE LII.—*Jack Fruit.*

One fourth natural size.

G. P. W. Collection. PLATE LIII

Anona muricata.

SOUR SOP.

This small, hardy evergreen tree is very common in Hawaii. Its dark green, glabrous leaves are pointed, elliptical, and are shiny on the upper surface, but rusty beneath. The greenish-yellow flowers are usually solitary, and have a peculiar odor. The fruit is large, varying in weight from 1 to 15 pounds. In shape, it is either oblong or conical and blunt. The rough, dark green, shiny skin, which is irregular in thickness, is studded with fleshy spines. The soft, white, cotton-like pulp is divided into sections, each containing a shiny, black seed, about half an inch long. These are very readily propagated.

PLATE LIII.—*Sour Sop.*
One third natural size.

G. P. W. Collection. PLATE LIV

Anona Cherimolia.

CHERIMOYER.

The Cherimoyer, a well-known fruit of the tropics, is said to be a native of Peru. It is naturalized in Central America, is hardy in the mildest coast regions of Spain, and in Jamaica is cultivated up to an elevation of nearly 5000 feet. It thrives on the Florida Keys, and is also grown to a limited extent in Southern California. The tree grows to a height of from 10 to 20 feet; its branches are spreading, and the dark, shiny leaves are either ovate or oblong, and are sparsely hairy above and velvety beneath.

The single petaled, velvety-green flowers are very fragrant. The fruit, which is about the size of a large orange, is heart-shaped and slightly flattened at the stem end. When ripe, the skin is a greyish-green, and is covered with slightly-raised semi-circular markings. The white pulp, which is soft and rich, is divided into cells, each containing a black seed about the size of an ordinary bean. The Cherimoyer comes true to seed and bears in about three years. It is one of the most delicious fruits, and its delicate, slightly-acid flavor is very characteristic. The Cherimoyer was one of the earliest fruits introduced to these Islands, and the best specimens of its kind are grown in Kona and Kau, Hawaii, where it continues to propagate itself naturally from seed.

PLATE LIV.—*Cherimoyer.*

One half natural size.

G. P. W. Collection. PLATE LV

Anona reticulata.

CUSTARD APPLE.

This tree, which is not common in Hawaii, is rather delicate, and grows to a height of from 10 to 15 feet. It is a native of the Antilles, and is a very popular tree in the West Indies. It thrives in Southern California. Its leaves, which are either lanceolate or oblong and pointed, are glabrous above and rough beneath. In color they are light green and rather brittle, when bruised they emit a very unpleasant odor.

The flowers are three-petaled and are greenish or yellowish, with purple spots at the base. Artificial pollination will induce the flowers to set and produce better crops. The heart-shaped fruit is from 3 to 5 inches in diameter. The skin is smooth, with small depressions; when ripe, it is a pinkish-yellow and shading to a russet. Next to the skin the pulp is soft and creamy-yellow, while toward the center it is quite white. The flavor is sweet and delicious. There are numerous smooth, black seeds. This fruit, like its cousin the Cherimoyer grows true to seed.

PLATE LV.—*Custard Apple.*

One third natural size.

G. P. W. Collection. PLATE LVI

Anona squamosa.

SUGAR APPLE—SWEET SOP.

This small tree is native of the West Indies, from which country the plants found growing in many of our gardens in these Islands were imported. The thin leaves are ovate-oblong, and are very slightly hairy on both sides. The greenish flowers are about an inch long. The fruit which is from 3 to 4 inches in diameter, is the shape of a pine cone; it is greenish-yellow when ripe, and each carpel forms a slight portuberance. The sweet, creamy-white pulp is very delicious. There are numerous small smooth, brownish-black seeds, which germinate readily, and the plants bear fruit in from two to four years. This variety of anona is sensitive to drought, and thrives well at the high elevations.

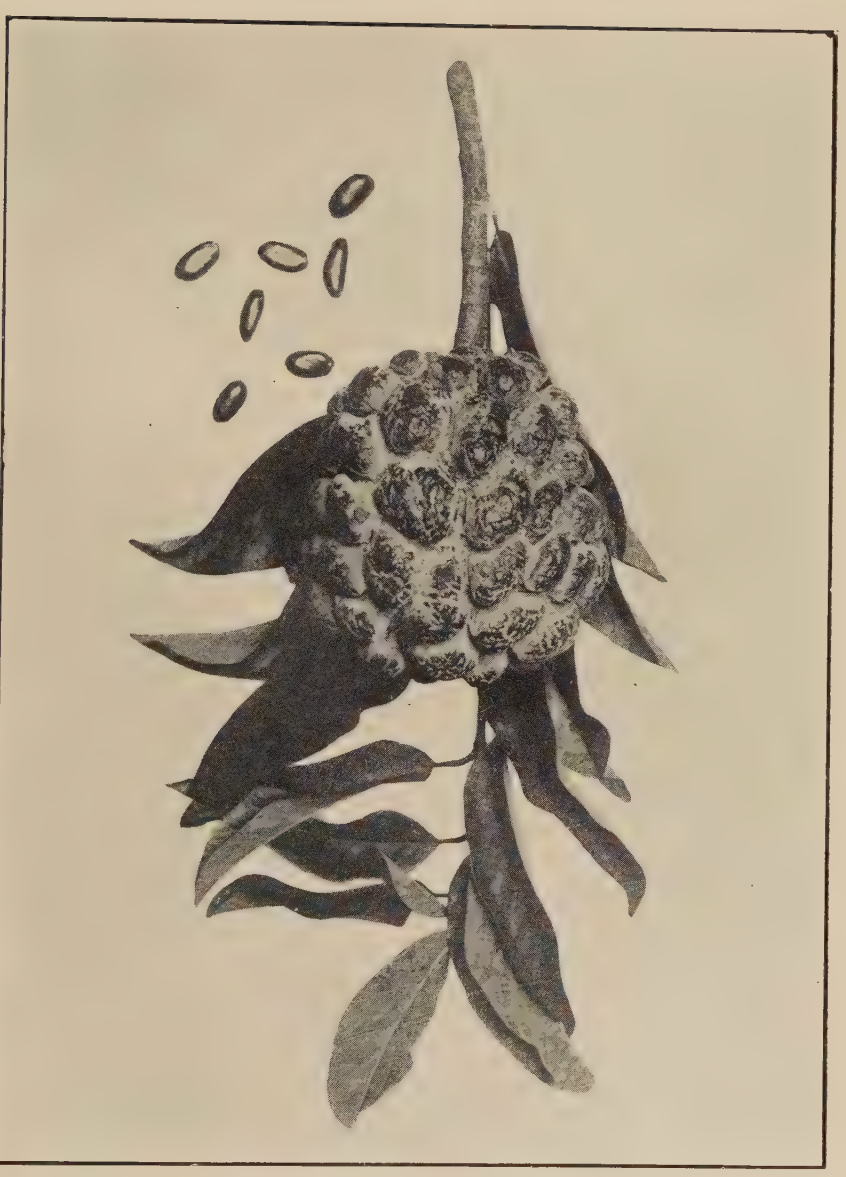

PLATE LVI.—*Sugar Apple—Sweet Sop.*
One half natural size.

G. P. W. Collection. PLATE LVII

Psidium Guayava pomiferum.

(Common guava.)

The Guava is an extensive genus of low-growing evergreen trees, found chiefly in the West Indies, South America, and China. They have become naturalized in Hawaii, and may be found growing wild on waste lands and by the roadside. In some localities growing so rank as to become troublesome. The leaves are oval to oblong, usually accuminate, glabrous above and pubescent beneath, and have prominent veins. The fragrant, white, solitary flowers are axillary.

The somewhat rough skin of the globose fruit is a brownish-yellow, and the firm, dark-pink pulp, in which is embedded numerous seeds, is generally acid and aromatic. This guava is the source of the famous guava jelly of commerce.

PLATE LVII.—*Psidium Guayava pomiferum* (*common guava*).

One half natural size.

G. P. W. Collection. PLATE LVIII

Psidium Guayava.

(Sweet red.)

This guava has the same general characteristics as the preceeding variety. It is more frequently found in valleys and gulches than in the open. Its red pulp is firm and sweet.

PLATE LVIII.—*Psidium Guayava* (*sweet red*).

G. P. W. Collection. PLATE LIX

Psidium Guayava.

(White lemon guava.)

The lemon guava tree grows taller and somewhat more erect than the others. The pear-shaped fruit is large, often 3 inches in length. It has a rough, greenish-white skin, and the white pulp is sweet. This is a cultivated variety, and is found growing in a few gardens in these Islands.

PLATE LIX.—*Psidium Guayava* (*white lemon guava*).
One half natural size.

G. P. W. Collection. PLATE LX

Psidium Guayava pyriferum.

"WAIAWI."

This handsome evergreen tree was an early introduced species, and now is very common about the islands. Grows very symmetrically, and attains the height of 20 to 25 feet. Leaves, small, lanceolate, shiny, the trunk and branches smooth. Flowers white and very fragrant; fruit small, pear-shaped, pulp yellow and containing many seeds; this species is very prolific, but the fruit is inferior.

PLATE LX.—*"Waiawi."*

One half natural size.

G. P. W. Collection. PLATE LXI

Psidium Cattleyanum.

STRAWBERRY GUAVA.

One of the hardiest of the guavas, and said to be a native of Brazil. The date of its introduction to Hawaii is not recorded, and as Hillebrand makes no mention of it, it is probably of recent importation. A shrubby tree 15 to 20 feet high. Leaves opposite, obovate, small, leathery, dark-green, shiny. Flowers white, fragrant. Fruit spherical, about one inch in diameter, purple-reddish when ripe, soft, juicy pulp, which has an agreeable flavor, and containing many small seeds. This fruit is used for making jams and jellies, and bears a crop more or less during all the months of the year.

PLATE LXI.—*Strawberry Guava.*
One half natural size.

G. P. W. Collection. PLATE LXII

Psidium Cattleyanum.
(var. *lucidum.*)

This low-growing shrub is occasionally cultivated in these Islands. It has opposite obovate leaves, and fragrant white flowers. The round fruit, which has a sweet, yellow pulp, is larger than the strawberry guava, and has a more delicate flavor.

PLATE LXII.—*Psidium Cattleyanum.*
(var. *lucidum.*)
One half natural size.

G. P. W. Collection. PLATE LXIII

Psidium molle.

This species was introduced to Hawaii by Mr. A. Jaeger; and a single specimen of its kind is now growing at the Old Plantation, Honolulu. It is a low-growing, slender, willow-like tree of straggling growth. The opposite leaves are small, stiff and rough, The white flowers are fragrant. The small, round fruit is brownish-green, turning to a pale yellow when ripe. The white pulp is slightly acid, and contains many seeds. This guava is rather an inferior fruit.

PLATE LXIII.—*Psidium molle.*
One half natural size.

G. P. W. Collection. PLATE LXVI

Mangifera indica.

MANGO.

The mango, which is a native of South Asia, is extensively cultivated throughout India, the Islands of the West Indies, and somewhat in Florida. In Hawaii it has become thoroughly naturalized, and is one of the most common trees; growing from the sea level up to about 1,000 feet.

A hot, rather dry, climate, with well-drained soil suits it best. It is an evergreen, shady tree of quick growing habit, sometimes reaching a height of 70 feet, and having a round, dense top. All parts of the mango tree have a resinous fragrance, that suggests turpentine. Its thick, shiny leaves are from 6 to 10 inches in length. The greenish, scented flowers are borne in large terminal panicles; and these are folowed three or four months later by the fruit, which is large and kidney-shaped, having a smooth, rather soft, pale-green skin, with tints of yellow and red. The large seed is nearly as long as the fruit, its shell is rough and fibrous, and the kernel is shaped like a bean. In the inferior varieties of mangoes the pulp is full of fibre and tastes strongly of turpentine. There are numerous varieties of the mango cultivated in Hawaii; the fruit of which varies much in point of flavor, juiciness, as well as in the size and shape of the seed.

Within the past ten years improved varieties have been imported; notably the Alphonse, Cambodiana, Pirie, and many others. These have thrived well and have borne delicious fruit; from them many grafts have been made and the finer grades of mangoes have been disseminated. Propagation is effected by seed, by grafting or inarching, and by budding. The mango as a rule does not come true to seed; also seedlings take much longer to fruit than do the grafted trees.

The illustration on the opposite page is that of the socalled common mango, which was brought to Hawaii from Mexico.

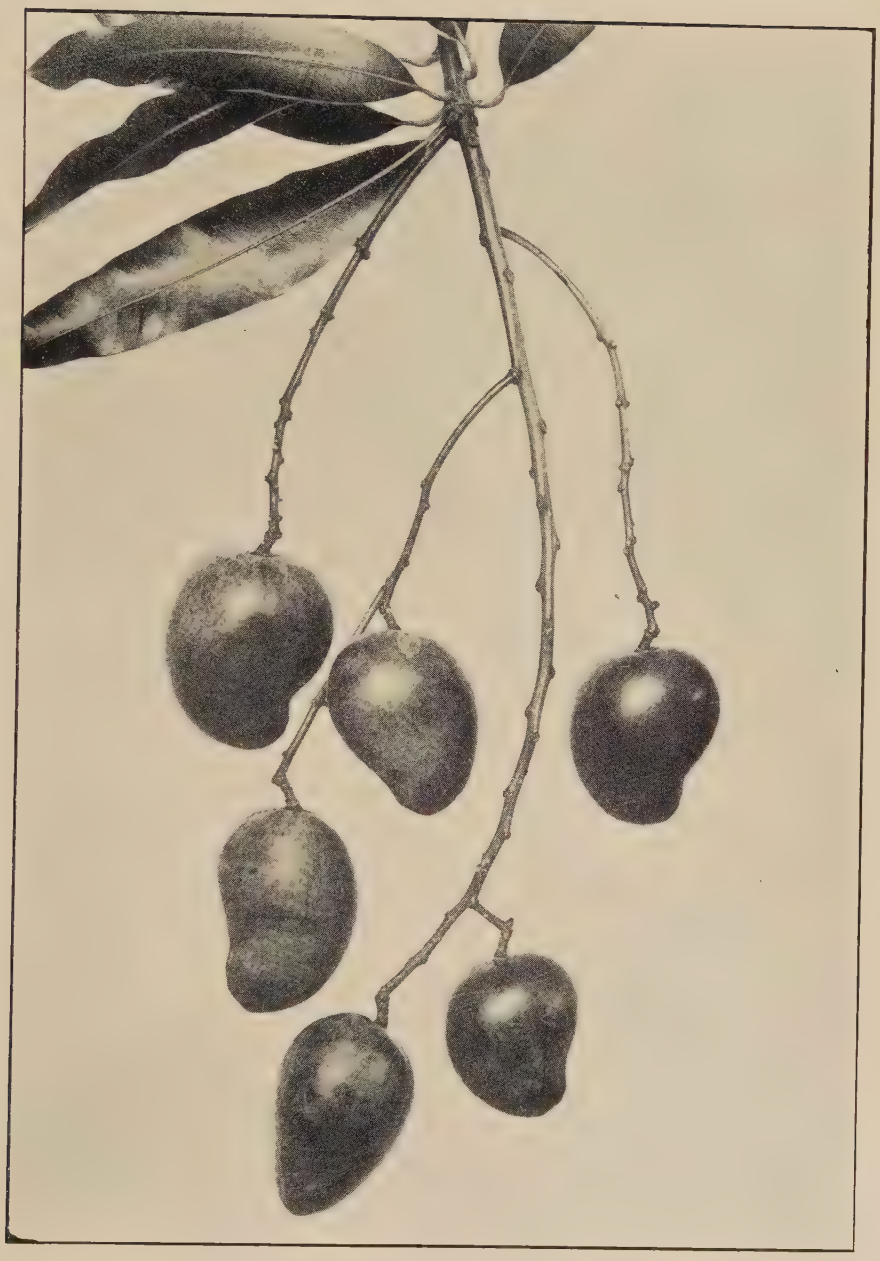

PLATE LXIV.—*Mango.*

One third natural size.

G. P. W. Collection. PLATE LXV

Mangifera indica.

MANINI MANGO.

This tree is supposed to be the first mango tree brought to the Hawaiian Islands. It was planted in the early part of the nineteenth century by Don Marin, whom the Hawaiians familiarly called "Manini." He brought to Hawaii many useful trees and plants; among the number was this mango, which he planted in his vineyard, then known as "Ka Pa Waina," and there it may be found today; a venerable tree standing about 80 feet high, having a spread of over 100 feet, and its trunk measuring 15 feet in circumference. Although a prolific bearer, its fruits, which are borne in large clusters, are small, and of an inferior quality, having a thick skin and a large, hairy seed.

PLATE LXV.—*Manini Mango.*

One half natural size.

G. P. W. Collection. PLATE LXVI

Mangifera indica.

NO. 9 MANGO.

This mango, with its distinctive shape, is one of the few types that comes true to seed. The first and original tree, which was planted at the Government Nursery, Honolulu, was brought from Jamaica by Joseph Marsden, Esq. This tree is a prolific bearer, and its seeds have been widely distributed throughout these Islands. The fruit is large and regular in size, having a thick skin which is of a light-green color. The pulp is pale yellow, very juicy, and slightly acid. There is a very large, hairy seed.

PLATE LXVI.—*No. 9 Mango.*

One half natural size.

G. P. W. Collection. PLATE LXVII

Musa varities.

BANANA—" MAIA."

The banana, which has been cultivated from the most remote times, is a plant of great importance in tropical and sub-tropical climates, where its highly nutritious fruit is used as food. It is a large herbaceous, slightly shrubby, plant of very easy growth, having immense, gracefully-arching, undivided leaves. There are numerous varieties, the fruit of which differs in shape, color and flavor.

As decorative plants in landscape gardening, few subjects equal the choice species of the banana; and on account of its utility, combined with its beauty, it is considered one of the most valuable of tropical products. Propagation is by off-shoots or suckers. When a stalk is cut, the fruit of which has ripened, sprouts are put forth which in time bear fruit. The enormous flower stalk issues from the centre of the crown of leaves, and curves over with its own weight.

The flowers are arranged in a dense terminal panicle; they alternate with large, reddish scales, which drop off as the fruit stalk develops, and the finger-like fruits are in clusters. The Hawaiians seem to have possessed the banana from the earliest times, and about fifty varieties were known to the older natives. However, since the year 1855, the so-called Chinese banana (*Musa Cavendishii*), which was at that time introduced from Tahiti, has crowded out the native varieties, many of which are now extinct.

The accompanying cut shows a few of the different forms and sizes of the banana grown in Hawaii.

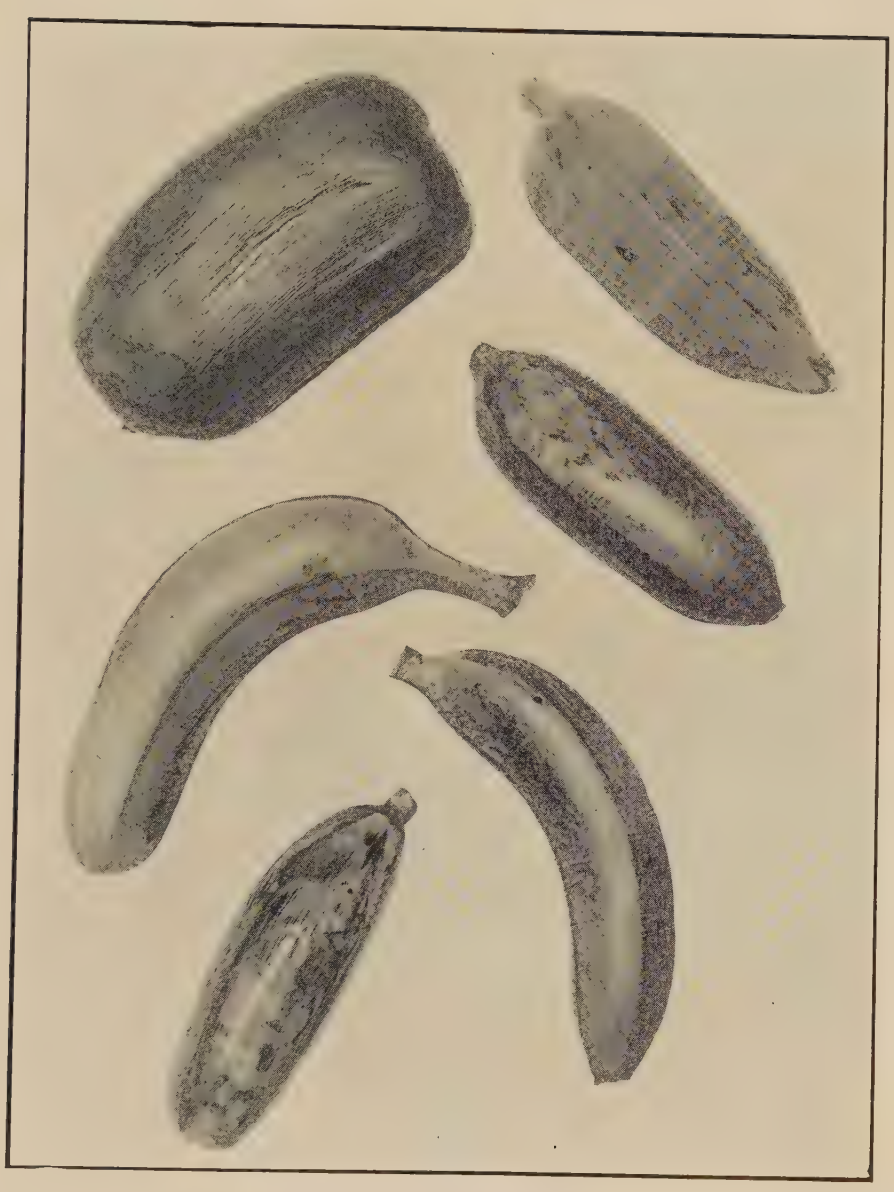

PLATE LXVII.—*Banana*—"*Maia.*"

One half natural size.

Moa
Popoulu
Lele

Largo
Red Cuban
Chinese

G. P. W. Collection. PLATE LXVIII

Morinda citrifolia.

"NONI."

This species is found in nearly all the Pacific Islands. The date of its introduction to Hawaii, however, is not recorded. It is a small tree which grows in the low lands. Its shiny, oval leaves have short petioles. The white flowers are about 1 inch in length. The fruit is whitish-yellow when mature, and when decaying it emits a very offensive odor. The seeds are interesting because they will float a great length of time in salt water, their buoyancy is caused by a distinct air cell.

PLATE LXVIII.—"*Noni.*"
One half natural size.

G. P. W. Collection. PLATE LXIX

Vaccinium reticulatum.

"OHELO."

This is an erect dwarf shrub growing to a height of from one to two feet, having stiff, crowded branches with leaves varying in form, from oblong to obovate, and in color from green to green tinged with yellow and red. The white flowers are solitary, and come mostly in the axils of the true leaves. The globose fruit is a fleshy, shiny berry, much resembling the cranberry; in color it is yellow or pale rose, and is covered with a waxy bloom.

The Ohelo thrives best in the higher elevations, from 4000 to 8000 feet. It grows particularly well on the mountain slopes of Hawaii and Maui. It is an edible berry, and is the principal food of the rare Hawaiian goose, now to be found in only a few localities. The Ohelo has always been a favorite subject of Hawaiian songs and legends, and was used as one of the offerings to the Goddess Pele.

PLATE LXIX.—*''Ohelo.''*

Natural size.

G. P. W. Collection. PLATE LXX

Solanum pimpinellifolium.

CURRANT TOMATO.

The first illustration on the opposite page is that of the currant tomato; an annual found growing wild in great profusion in the low lands of our valleys. It is of weak growth, very diffuse anl twiggy, and scarcely pubescent. Its obovate leaves are small with nearly entire leaflets, and very small secondary leaflets; the elongated racemes bear from 100 to 40 small, currant-like red berries, which are very sweet.

Solanum Lycopersicum.

GRAPE TOMATO.

The second illustration is that of the grape tomato, which has grayish-green leaves and slender, ascending stems. The leaves are pinnate with small, nearly entire leaflets; the main leaflets are notched or even lobed toward the base. The fruit is a bright red berry about half an inch in diameter, and is fresh and aromatic.

PLATE LXX.—*Currant Tomato. Grape Tomato.*
One half natural size.

G. P. W. Collection. PLATE LXXI

Solanum nodiflorum.

"POPOLO."

This glabrous, annual, growing from 1 to 2 feet in height, is common to most tropical countries, and in Hawaii was probably of aboriginal introduction; as the Hawaiians have many ways of using the fruits and the leaves, for medicinal purposes. This plant is found on waste land, in old pastures, and by the roadside. Its ovate leaves are dark green. The whitish flowers are small, and the fruit is a small, shiny, black berry.

PLATE LXXI.—"*Popolo.*"

Natural size.

G. P. W. Collection. PLATE LXXII

Aleurites moluccana.

CANDLE NUT TREE—"KUKUI NUT."

The Kukui tree is easily recognizable from afar off by the pale hue of its foliage, which appears to be dusted over with flour. It is a handsome, soft wood, evergreen tree, growing to a height of from 40 to 60 feet, and is widely spread over tropical Polynesia, and a great part of Malaysia; and by all branches of the Polynesian race it is called by the same name: Kukui or Tutui. The Hawaiians tattooed their skins with a black dye which they prepared from the juice which is found in the fleshy covering of the green fruit. The leaves are alternate, 3 to 5 lobed, pubescent, and have long petioles. The yellowish-green flowers are in terminal clusters. The fruit is spherical, from 1 to 2 inches in diameter, and light-green in color, changing to a dull-brown when ripe. It contains one or more nuts, or seeds, which have a very hard, boney shell, the surface of which is uneven like the shell of a walnut. The kernels of this nut, when dried, were strung together, or bound on sticks, and served the natives for torches or candles: thus the English name of Candlenut Tree. The oil obtained from the nut was used by the Hawaiians for burning in stone lamps. The kernel, when baked, pounded, and mixed with salt and Chili peppers, makes a brown paste which is very appetizing. This is much esteemed by the Hawaiians, who call it "Inamona."

PLATE LXXII.—*Candle-nut Tree—"Kukui Nut."*

One third natural size.

G. P. W. Collection. PLATE LXXIII

Terminalia Cattapa.

TROPICAL ALMOND.

"KAMANI."

This deciduous tree, generally called Kamani by the Hawaiians, with its spreading branches in horizontal whorls or layers, is one of the familiar and useful shade trees of these Islands. Leaves large, opposite, broadly obovate-obtuse, very short petioled, and turning brilliant shades of red and yellow during the autumn. Flowers greenish-white on long spikes, upper ones staminate, the lower ones perfect. The almond-shaped fruit is a compressed hard, nut-like body 1 to 1½ inches long, with a thin outer covering which is sweet, and spongy. There is generally one, sometimes two, small, edible kernels found embedded in the hard body. These may be eaten raw, or roasted.

PLATE LXXIII.—*Tropical Almond—"Kamani."*
One half natural size.

G. P. W. Collection. PLATE LXXIV

Calophyllum inophyllum.

"KAMANI."

This Kamani is a large tropical tree, having shiny, leathery, evergreen foliage. Its leaves are obovate, usually marginate, and its white flowers are very fragrant. The fruit, which generally comes in clusters, is round, about the size of a large walnut, and has a thin, leathery skin which covers a boney shell, inside of which is a corky substance surrounding the seed or kernel. This tree was an early introduction to these Islands, and is commonly seen on our seacoasts.

PLATE LXXIV.—"*Kamani.*"

One half na ural size.

G. P. W. Collection. PLATE LXXV

Noronhia emarginata.

This tree is a native of Madagascar and also of Mauritius. A fine specimen may be seen at the Government Nursery, Honolulu. It is a handsome evergreen with entire, cuneate, coriacious leaves, having short petioles. The yellowish flowers come in clusters, and are quite fragrant. The fruit is a one-celled drupe, almost round, and about an inch in diameter. It is purple when ripe, and has a tough skin. The sweet, edible pulp surrounds a very large seed.

PLATE LXXV.—*Noronhia emarginata.*
One half natural size.

G. P. W. Collection. PLATE LXXVI

Castanea sativa.

JAPANESE CHESTNUT.

This is a close-headed tree of slender growth, attaining a height of from 30 to 50 feet. Its leaves are smaller than those of other chestnuts, generally from 3 to 7 inches long, and are either rounded at the base or reduced to a long, bristle-like point. The monoecious flowers are arranged in long catkins. The small burs have a thin, papery lining, and short, widely-branching spines. The nuts are large and glossy, usually three in a bur. They are somewhat inferior in quality, but are palatable when cooked.

To my knowledge there is but one tree of this variety growing in these Islands, and it is to be found on the slopes of Tantalus, where it was planted by the Department of Agriculture.

PLATE LXXVI.—*Japanese Chestnut.*

One half natural size.

G. P. W. Collection. PLATE LXXVII

Inocarpus edulis.

TAHITIAN CHESTNUT.

This tree, which is said to be a native of the Moluccas, is an evergreen of very rapid growth. Its straight trunk, with smooth, ashen-grey bark, its spreading branches, with their dense green foliage, make a very ornamental as well as useful tree. Its leaves are alternate and simple. The small, fragrant, pale yellow flowers are very numerous. The drupe is obliquely oval, and about the size of a goose egg, containing a large kernel which is edible when roasted, but is not especially palatable. The only trees of this variety growing in Hawaii are to be found at Ahuimanu Ranch, Oahu, where they fruit regularly, and the seeds germinate after being in the ground some months.

PLATE LXXVII.—*Tahitian Chestnut.*

One third natural size.

G. P. W. Collection. PLATE LXXVIII

Canarium commune.

CANARY NUT.

This medium-sized nut-bearing tree is found growing in Java, Guam and the Philippines, and from any one of those countries may have been introduced to Hawaii. A fine specimen may be seen at the Government Nursery, Honolulu. Its leaves are alternate, odd pinnate. The small flowers come in terminal panicles. The fruit or nut is ellipsoidal. The thick skin, which is purple-colored when ripe, covers a hard, three-lobed stone, which differs from a pecan nut only in that it is sharp at each end. The kernel is small, sweet and edible. Trees propagated from the mature nuts.

PLATE LXXVIII.—*Canary Nut.*
One half natural size.

G. P. W. Collection. PLATE LXXIX

Canarium commune.

CANARY NUT (round variety).

Few trees of this round variety are to be found in Hawaii. Its leaves are smaller than those of the preceeding variety, and it is a very poor bearer.

PLATE LXXIX.—*Canary Nut (round var.)*
One half natural size.

G. P. W. Collection. PLATE LXXX

Macadamia ternifolia.

QUEENSLAND NUT.

This sub-tropical Australian tree sometimes grows to a height of 60 feet, but in Hawaii is of medium size. It is symmetrical and handsome, having dark green, shiny foliage, and long tassel-like white flowers. Its glabrous leaves are sessile, oblong, lanceolate, serrate, with fine prickly teeth, and come in whorls of 3 to 4, varying in length from a few inches to a foot. Flowers small; fruit has a thick, very hard shell, which when ripe is a smooth, shiny brown. The kernel is white, crisp and sweet, and has the flavor of hazel nuts. It may be eaten either raw or roasted. The tree matures its fruit in the Fall months, and is easily propagated from the fresh nuts.

PLATE LXXX.—*Queensland Nut.*
One half natural size.

G. P. W. Collection. PLATE LXXXI

Macadamia sp.

This variety of the Queensland nut has leaves and fruit larger than those of *Macadamia ternifolia.*

PLATE LXXXI.—*Macadamia sp.*
One half natural size.

G. P. W. Collection. PLATE LXXXII

Aegle Marmelos.

BHEL OR BAEL FRUIT.

This small spinose tree is a native of tropical Asia, and although not commonly grown in Hawaii, specimens may be found in several gardens. It has alternate trifoliolate leaves, and its flowers, which grow in clusters, are small and fragrant. The gourd-like fruit, with its hard shell, is from 2 to 4 inches in diameter, and is either round or pear-shaped, and although heavy and solid, it will float in water. The rind, when ripe, is a yellowish-brown color, and is studded with oil cells. The interior surface of the skin is lined with open-mouthed cells, which pour their gummy secretions into the interior of the carpel, filling it and bathing the seed. The pulp is sweet and aromatic, and is esteemed for making conserves, and also as a cooling drink.

In India, the roots and leaves are used medicinally. Bael gum is a sticky, astringent substance soluble in water. The fruit contains several large, flat, woolly seeds, which germinate readily, and the plant is also very easily propagated from root cuttings.

PLATE LXXXII.—*Bhel or Bael Fruit.*

One third natural size.

G. P. W. Collection. PLATE LXXXIII

Diospyros decandra.

BROWN PERSIMMON.

This is an evergreen tree rarely found in Hawaii. It has alternate, irregular, long, narrow leaves, shiny dark-green on the upper side, a velvety light-green on the underside, and has a long petiole. The branches are brittle, light-green, smooth and shiny when young, and after the leaves shed become woody and inclined to dry back.

The trunk and bark of the tree is covered with warty excresences. The solitary flowers are four-petaled. The edible fruit ripens in December, is round, depressed, about 2½ inches in diameter, in color light-green dotted with numerous white spots. When quite ripe the thin skin turns to a shiny-brown. The soft chocolate colored pulp is sweet and contains from 1 to 8 large flat seeds.

PLATE LXXXIII.—*Brown Persimmon.*

Natural size.

G. P. W. Collection. PLATE LXXXIV

Lucuma Rivicoa.

EGG FRUIT.

This small evergreen tree, which is a native of Brazil, is found only in one or two gardens in Honolulu. Its leaves are elliptic-obovate, resembling those of the mango. The yellow flowers are single, the fruit is the size and shape of a hen's egg, and has the flavor of the yolk of an egg sweetened with sugar. It has from one to three large seeds, which are easily germinated.

PLATE LXXXIV. *Egg Fruit.*

One third natural size.

G. P. W. Collection. PLATE LXXXV

Eriobotrya Japonica.

LOQUAT.

The Loquat has been for many years a familiar fruit in our gardens, and is a native of China and Japan. It is a low evergreen tree with thick foliage, and in congenial climates is a profuse bearer. Its leaves are thick, oblong, and remotely toothed and grow near the ends of the branches. The white flowers grow in clusters, are very fragrant, and the fruit, which also ripens in clusters, about Christmas time, is pear-shaped, and has an agreeable acid flavor. The seeds are large, and germinate readily. Fine grafted and budded varieties have been introduced by local horticulturalists.

PLATE LXXXV.—*Loquat.*

One fourth natural size.

G. P. W. Collection. PLATE LXXXVI

Litchi Chinensis.

"LICHEE."

This tree, with its dense foliage, is a native of Southern China. The first tree of this variety was brought to Hawaii by Mr. Afong, and planted at his residence in Nuuanu avenue, Honolulu, in the year 1870.

The leaves are alternate, and abruptly pinnate; the oblong leaflets are not quite opposite. Flowers pale green, small and regular, producing bunches of reddish-colored fruits, each about the size of a small walnut. They are covered with a parchment-like skin having many soft spines. The interior consistss of a large seed covered with a whitish pulp of a sweetish acid flavor; this pulp when dried in the shell becomes somewhat shriveled, brownish in color, and very sweet.

The fruiting season is in July, and as there are but few trees here that bear, high prices are obtained for this rare fruit, which is much prized by the Chinese. Fresh seeds will germinate, but it requires so many years for these seedlings to bear that grafted and budded plants are imported from China.

PLATE LXXXVI.—"*Lichee.*"
One third natural size.

G. P. W. Collection. PLATE LXXXVII

Euphoria Longana.

LONGAN.

This tree is a native of India and Southern China. It produces its flowers and fruits at about the same time of year as does the Litchi, which it somewhat resembles, although its fruits are somewhat smaller and less palatable. The tree grows to a height of about 20 feet. It has large, alternate, pinnate leaves, and the oblong leaflets are not quite opposite; they are glossy on the upper surface, and a dusty-brown on the underside. The small flowers come in terminal panicles; and the fruit, which is borne in clusters, has a thin, brittle, somewhat rough shell. There is one large, smooth, hard seed, around which is a thin layer of sweetish, aromatic pulp. The best fruits raised here are those grown by the Chinese.

PLATE LXXXVII.—*Longan.*
One third natural size.

G. P. W. Collection. PLATE LXXXVIII

Morus nigra.

MULBERRY.

This low-growing tree is a native of southwestern Russia and Persia. It has rough, dark-green leaves, usually not lobed. The thick, fleshy fruit is variable in size. The mulberry grows readily from cuttings.

PLATE LXXXVIII.—*Mulberry.*
One third natural size.

G. P. W. Collection. PLATE LXXXIX

Garcinia mangostana.

MANGOSTEEN.

This tree is a native of Sumatra and of the Islands of the Eastern Archipelago. It is of medium size, the stem rising to a height of about 20 feet; and its branches coming out in regular order give the head of the tree the form of a parobola. The leaves are about 8 inches long and 4 inches broad at the middle; they are a beautiful green on the upper side and a delicate olive on the under side. The flowers resemble a single rose with dark-red petals. The fruit is round, about the size of a small orange, and has a characteristic persistent calyx. The shell is at first green, and when ripe changes to purplish-brown marked with yellow spots. The Mangosteen is called the queen of fruits, and the tree upon which it is produced is most graceful and beautiful.

Those who have tasted this fruit in its perfection declare it to be indescribably delicious. The Mangosteen must have a hot, moist, and fairly equable climate throughout the year.

Many Mangosteen trees have been brought to Hawaii, and have received intelligent care, but they have not thrived well; and have eventually died. Only two have ever produced fruit; one in the garden of Mr. Francis Gay of Kauai, which bears its fruit annually, and the other tree at Lahaina, Maui, in the garden formerly the property of Mr. Harry Turton.

PLATE LXXXIX.—*Mangosteen.*

Two thirds natural size.

G. P. W. Collection. PLATE XC

Garcinia Xanthochymus.

This handsome tree is a native of India, and was first introduced to Hawaii by Mr. Albert Jaeger. It has long, narrow, leathery leaves of a bright, glossy green. The flowers, which have four petals, appear at the axil of the leaves, and the fruit, which is about the size of a small quince, has a smooth, thin skin, which is yellow when ripe. The firm pulp is golden yellow, very juicy, and sour, and the seeds are large. This variety is common in the Islands, and has often been mistaken for the Mangosteen. It ripens its fruit in October and November. This variety has been used to inarch the garcina mangostana upon.

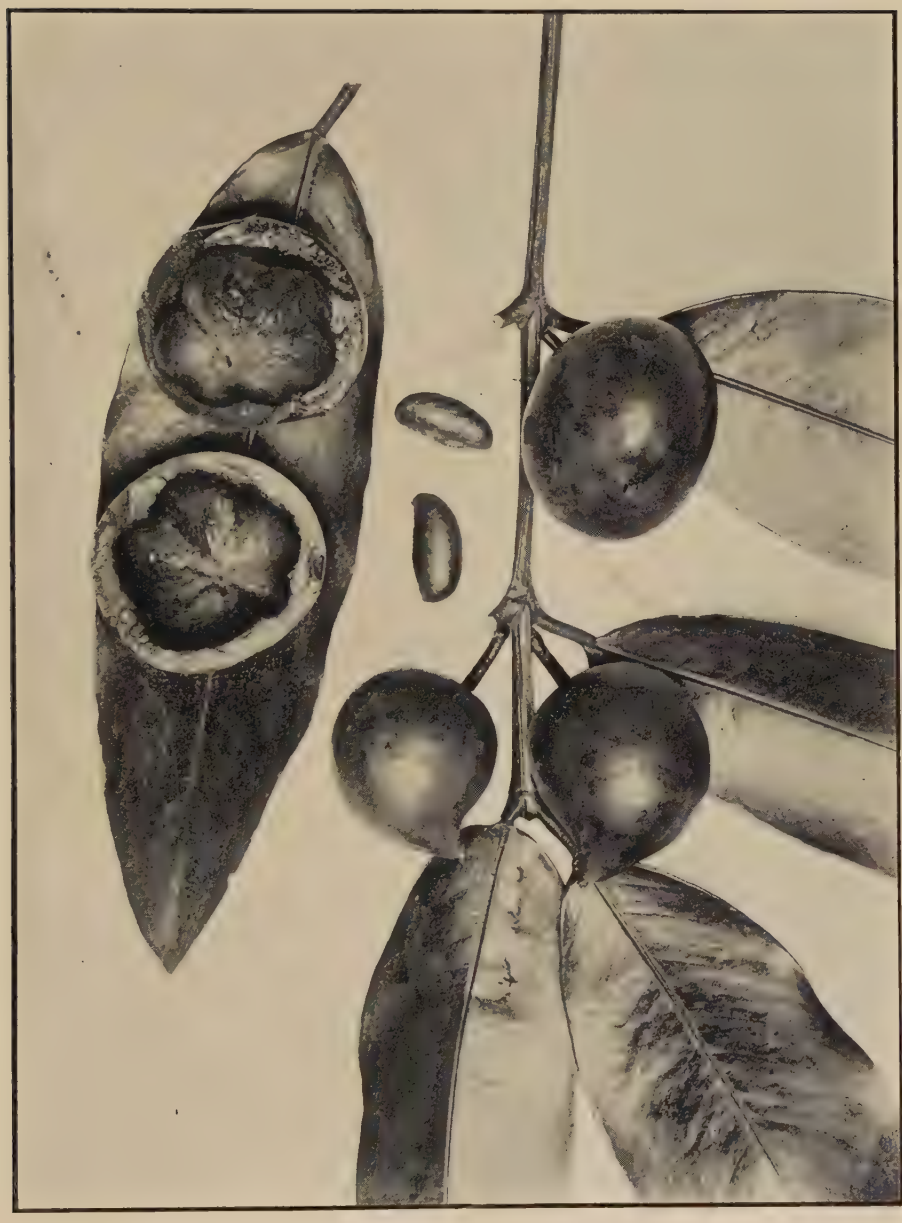

PLATE XC.—*Garcinia Xanthochymus.*

One third natural size.

G. P. W. Collection. PLATE XCI

Bunchosia sp.

This tree was doubtless introduced to Hawaii from South America. There are only two specimens of its kind growing in Honolulu. Its fruits are edible, but not especially palatable. It is a small tree having terete branches, and its opposite leaves are oblong-elliptical, dark-green above and a lighter, somewhat glossy-green beneath. The petioles are short. The axillary inflorescence comes in long, slender cymes, and the five-petaled flowers are yelow. When ripe, the obovate fruit is a purplish-yellow, having usually two seeds, and but one seed when abortive.

PLATE XCI.—*Bunchosia sp.*
One half natural size.

G. P. W. Collection. PLATE XCII

Malpighia glabra.

BARBADOS CHERRY.

This small shrub is a native of the West Indies. Its dull-green leaves are opposite, ovate and glabrous, either entire or spiny-toothed. The rose-colored flowers are axillary and five-petaled. The bright red fruit is about the size of a cherry, and has a thin skin, and its acid pulp is used for jam and preserves. The seeds or stones are large, four-angled, and germinate readily; plants are also produced by cuttings. Though not common in these Islands, there are, however, a few specimens of this plant to be found in several of the private gardens of Honolulu.

PLATE XCII.—*Barbados Cherry.*

Natural size.

G. P. W. Collection. PLATE XCIII

Theobroma Cacao.

CHOCOLATE, COCOA.

In Hawaii this tropical tree grows to a height of from 10 to 30 feet. It has large, pointed leaves, and the new growth is wine-colored. The flowers appear on the trunk and mature branches, and the fruit which follows is about 8 to12 inches long, and is called the pod; inside of this pod are beans or seeds, from which the commercial product called cocoa is made, through a process of drying and curing. Chocolate is the term used for the sweetened preparations of the roasted and ground beans, with a large proportion of the original fat retained. Cocoa preparations are the same material in fine powder, sweetened and unsweetened, with a greater part of the fat extracted.

Cacao cultivation has never been successfully attempted in Hawaii. However, a few isolated trees can be found at Ahuimanu Ranch, Oahu, where they were planted by the Catholic brothers as an experiment some years ago.

PLATE XCIII.—*Chocolate, Cocoa.*

One fourth natural size.

G. P. W. Collection. PLATE XCIV

Hibiscus Sabdariffa.

ROSELLE.

This bush or shrub is a showy annual growing to a height of from 5 to 7 feet. The stems are reddish, and the pale yellow flowers solitary. The leaves are palmate and of a light-green color. It is widely cultivated in the tropics, in Florida, and in Southern California; and also thrives in Hawaii. The dark crimson calyces are very fleshy and make excellent jelly, which has somewhat the flavor of the cranberry.

PLATE XCIV.—*Kosette.*

One third natural size.

G. P. W. Collection. PLATE XCV

Monstera deliciosa.

The Monstera deliciosa, one of the grandest of arid plants, is a native of the mountainous regions of Guatamala and Brazil. It climbs to a height of 12 or more feet, and its leaf stalks are often 3 feet long. It obtains nourishment from the tree upon which it attaches itself. Its leaves are huge and perforated. As the plant climbs, the stems emit aerial roots, many of which never reach the ground. The fruit which has the appearance of an elongated pine-cone, grows to a length of from 6 to 12 inches, and is about 2½ inches in diameter.

The rind is composed of plates which may be detached when the fruit is quite ripe. It is green in color until it ripens, when there appears a slight tinge of yellow. The creamy-white pulp has a most declicious flavor, somewhat resembling the banana, and also like the pineapple. It requires 18 months to mature the fruit. Propagation is by cuttings.

PLATE XCV.—*Monstera deliciosa.*
One fourth natural size.

G. P. W. Collection. PLATE XCVI

Anacardium occidentale.

CASHEW NUT.

This spreading tree is a native of the West Indies; and although it is seen in several gardens of our Islands, it is not common. The first tree of its kind was planted by Mr. Henry Davis in his grounds at Punahou. The tree grows to a height of from 15 to 20 feet. The light-green, leathery leaves are oval and rough, its pink flowers have a peculiar, strong fragrance. The fruit consists of two distinct parts; the heart-shaped nut or seed and the fleshy, pear-shaped receptacle to which it is attached. This receptacle is from 2 to 4 inches long, is either red or yellow, and is very juicy and astringent. The nut or seed is edible when roasted. It is much appreciated in the West Indies. While being roasted the fumes are said to be poisonous.

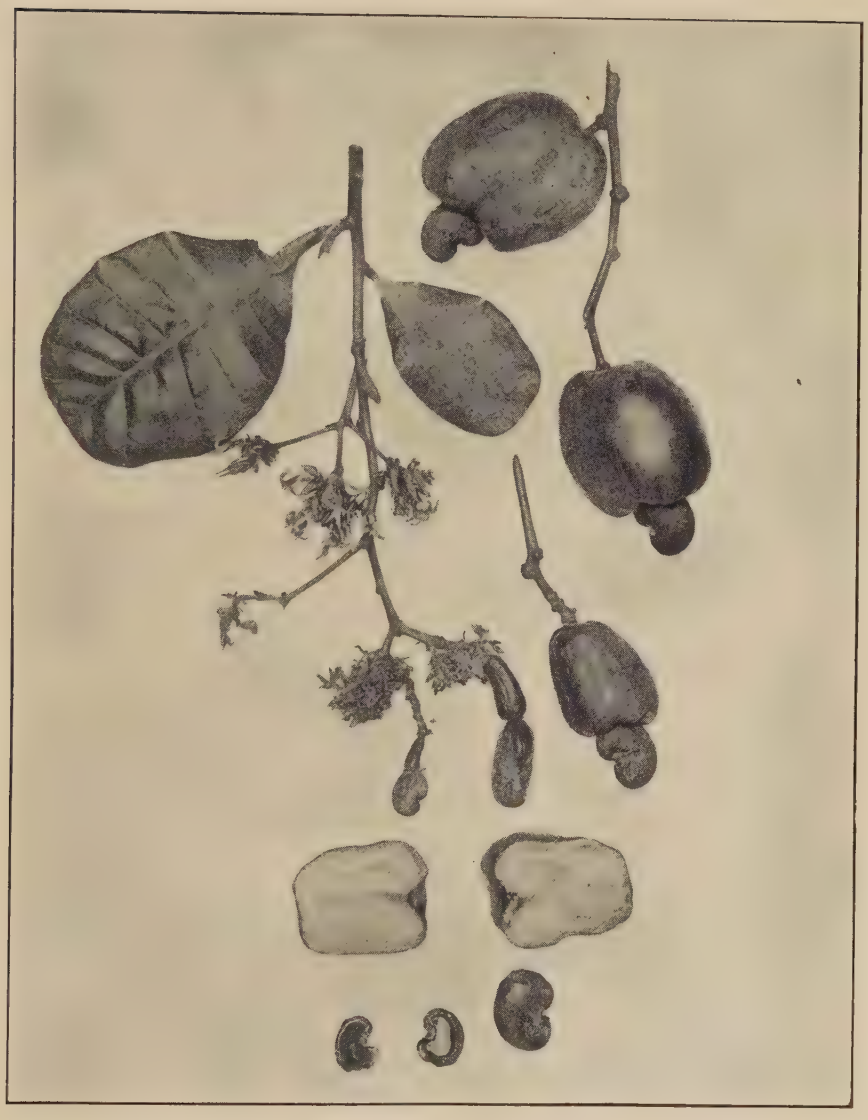

PLATE XCVI.—*Cashew Nut.*
One half natural size.

G. P. W. Collection. PLATE XCVII

Ziziphus Jujuba.

"JUJUBE."

This tree, which grows to a height of from 15 to 20 feet, is a native of China, from which country it was probably introduced to these Islands. Its branches are usually prickly; the leaves, which are from 1 to 3 inches in length, are alternate, ovate to oblong, obtuse, and are dark green and glabrous above, and tawny and nearly white beneath. The flowers are axillary. The yellow fruit, which ripens in March, is about the size of a cherry. When eaten raw, it has a bitter flavor, but it makes an excellent preserve.

PLATE XCVII.—"*Jujube.*"

One half natural size.

G. P. W. Collection. PLATE XCVIII

Phyllanthus emblica.

There is but one tree of this species that has ever fruited in Honolulu. It is to be found growing in the grounds of the Royal Mausoleum, Nuuanu Valley. It is of medium height, having a crooked trunk, and its thin, scattered branches grow irregularly. The numerous alternate leaves are pinnate, the obtuse leaflets growing close together, and are from one-half to three-fourths of an inch in length. Its minute flowers are greenish-yellow. The round, six-striated fruit is smooth and fleshy, and three-fourths to one inch in diameter. The seeds are enclosed in three or more obovate cells, each cell containing two seeds. The pulp is hard and bitter, but when cooked makes an excellent preserve.

PLATE XCVIII.—*Phyllanthus emblica.*

One half natural size.

G. P. W. Collection. PLATE XCIX

Phllanthus distichus.

OTAHEITI GOOSEBERRY.

This is a low-growing tree having large pinnate leaves with acute, alternate leaflets, which are about one to two inches in length. Its flowers grow on separate branches below the foliage. The fleshy, green fruit, which is borne in long clusters, is acid and astringent, but when made into preserves or pickles is palatable. The root and seeds have medicinal qualities. There is but one tree of this species in Honolulu. It is growing in the garden of Mr. Wm. Wolters.

PLATE XCIX.— *Otaheiti Gooseberry.*

One half natural size.

G. P. W. Collection. PLATE C

Olea Europea.

OLIVE.

The Olive, which is a native of Southwestern Asia, is not a tree of any great height, but is very longlived, and yields prolifically. Although not cultivated to any extent, the Olive has been growing in Hawaii for many years. However, it has fruited only in a few favorable localities, and nothing has ever been done to test its value commercially.

The tree thrives best in a warm, dry atmosphere, where the soil is rich and well drained. Long-continued droughts so detrimental to most plants will affect the Olive but slightly. The tree requires judicious pruning immediately after the fruit is gathered, when the sap is comparatively at rest. The small, thick leaves are lanceolate, opposite, and usually entire; they are dull green above and silvery beneath. The small white flowers, which come in panicles, are usually imperfect. The fruit is a small, ellipsoid drupe, which is bluish-black when ripe. Its oil is an important product. The Olive may be propagated from seeds, cuttings, layers, suckers and pieces of the old stumps. The seeds require some time to germinate, and the growth of the young plant is slow.

PLATE C.—*Olive.*

One half natural size.

G. P. W. Collection. PLATE CI

Vitis Labruscà.

"ISABELLA GRAPE."

This variety of grape was early introduced to these Islands, and has become very popular. It is a hardy vine, variable in productiveness, and is practically the only grape grown in any quantity in Hawaii. The leaves are of medium size, often roundish and thick; their upper surface is dark-green, the under surface is whitish-green. The Isabella is an attractive blue-black grape, bearing in large, well-formed clusters, having a thick bloom. The muskiness of the thick skin is somewhat objectionable.

PLATE CI.—*"Isabella Grape."*

One half natural size.

U. P. W. Collection. PLATE CII

Pyrus Sinense.

SAND PEAR.

This tree is a vigorous and clean grower, having strong, thick shoots, beautiful foliage, and very ornamental fruit. The dark-green leaves are broadly ovate, and long-pointed, with their margins thickly furnished with very sharp, almost bristle-like teeth. The large white flowers appear rather in advance of the leaves. The fruit is hard and rough, about 2½ inches in diameter, with generally a depression about the stem. The flesh is tough and gritty, but is very delicious when baked. Propagation is by cuttings.

PLATE CII.—*Sand Pear.*
One half natural size.

G. P. W. Collection. PLATE CIII

Passiflora quadrangularis.

GRENADILLA VINE.

This tall, strong climer is a native of tropical America. Its leaves are broadly ovate, and the strong stems are purplish in color. The large, interesting flowers are from 3 to 5 inches across. The sepals are linear and violet shaded, the petals are very narrow and lilac. The many rows of filaments in the crown are violet with bars of white below the middle, the inner and shorter set being deep violet. The oblong fruit attains a size from 5 to 9 inches in length, and in color is a pale, yellowish green. The suculent, edible pulp of its hollow center has an agreeable sub-acid flavor, and contains many flat seeds. This vine bears well where there are bees; artificial fertilization also increases the number of its fruits.

PLATE CIII.—*Grenadilla Vine.*
One half natural size.

G. P. W. Collection. PLATE CIV

Passiflora edulis.

PURPLE WATER LEMON.

"LILIKOI."

This strong, woody vine is native of Brazil, and is naturalized in most tropical countries. Its first introduction to these islands was at Lilikoi, district of Makawao, Maui, whence its native name. Its serrate leaves are large and deeply three-lobed; the white flowers are tinted with purple. The fruit is oblong, globular, and when ripe is purple in color; its shell-like skin is thick and crisp. The orange-colored edible pulp is very fragrant, and is filled with small seeds, which germinate readily.

PLATE CIV.—*Purple Water Lemon—"Lilikoi."*
One half natural size.

G. P. W. Collection. PLATE CV

Passiflora laurifolia.

YELLOW WATER LEMON.

This strong-growing, glabrous vine, climbing by tendrils, is a native of tropical America. The date when it was introduced to Hawaii, and by whom, is not known; but in the Hilo and Hamakua districts of Hawaii this variety grows wild. Its thick leaves are oval, oblong and entire, and have a short, sharp point. The flowers are about 2½ inches across, are white, with red spots on them. The fruit is slightly oblong, 2 inches in diameter, and very regular in size and shape. When ripe, it is yellow spotted with white. It has a medium-hard shell or skin, and the edible pulp is whitish-yellow, and contains many flat, black seeds.

PLATE CV.—*Yellow Water Lemon.*
One third natural size.

G. P. W. Collection. PLATE CVI

Passiflora alata.

This is a strong, vigorous vine, very suitable for arbors and trellises. It is not commonly found in Hawaii; however, a very fine specimen of its kind is growing in Dr. St. D. G. Walter's garden in Honolulu. The leaves are oval to ovate, the petioles having two glands. The fragrant purple flowers are about two inches in diameter. The ovoid-pointed fruit has a tough, leathery shell which, when green, is six-striated, with white stripes; when quite ripe the fruit is a dull orange-yellow. The numerous seeds are imbedded in the juicy, scented pulp, which is aromatic and delicious. Propagation is by seed and by cuttings.

PLATE CVI.—*Passiflora alata.*

One half natural size.

G. P. W. Collection. PLATE CVII

Passiflora, var. foetida.

This strong and hardy vine grows well on arbors and trellises. Its leaves are three-cleft, and have long petioles; and spiral tendrils spring from the axils. The single, pale-green flowers are surrounded by a green, lace-like covering. The fruit is nearly globular, and slightly pointed; it is about three-fourths of an inch in diameter, and when ripe is a bright scarlet.

PLATE CVII.—*Passiflora, var. foetida.*
Two thirds natural size.

G. P. W. Collection. PLATE CVIII

Cereus triangularis.

NIGHT-BLOOMING CEREUS.

Although this plant with its wonderful nocturnal blossoms may be found growing almost everywhere in the Islands, the best specimens of its kind may be seen on the stone walls of Oahu College. The beautiful creamy flowers with their yellow centers are large, about a foot long, and when in full bloom about the same in diameter. The tube is covered with large, leaf-like green scales. The fruit, which is about 3½ inches long and 2 inches in diameter, is covered with persistent, large, fleshy scales which are scarlet colored when ripe, and the interior pulp is edible and refreshing. Fruit, however, upon the night-blooming cereus in Hawaii is rather rare, although a few fine specimens have matured.

PLATE CVIII.—*Night-Blooming Cereus.*

Two thirds natural size.

G. P. W. Collection. PLATE CIX

Kigelia pinnata.

SAUSAGE TREE.

This medium-sized and very handsome shade tree is a native of tropical Africa. It was probably introduced to Hawaii by Dr. Hillebrand. A fine tree of this species is growing in Mrs. Foster's garden, Nuuanu avenue. It has large pinnate leaves, and panicles of purple flowers. The peculiar rough, grey, oblong fruits hang from a long stem, and present an odd appearance. This tree and also one other of the same variety growing in the grounds of the Queen's Hospital, very rarely set their fruit. Because of the difficulty of obtaining seeds, the sausage tree has not been widely distributed.

PLATE CIX.—*Sausage Tree.*

One fourth natural size.

G. P. W. Collection. PLATE CX

Phoenix dactylifera.

THE DATE PALM.

The date, which is a native of North Africa, Arabia, and Persia, is a noble palm, often growing to a height of from 80 to 100 feet. It is of remarkable longevity, and will continue to produce fruit even at the age of a hundred years. The neighborhood of the sea is considereed unfavorable to their production, although they will luxuriate in satlish soil and bear well when brackish water is used.

Many varieties of dates exist, the fruit differing in shape, size and color. They will grow from seeds, although the superior varieties can be continued only from off-shoots of the root. These will commence to bear in five years. In Asia, the growers of the commercial date find it necessary to pollinate artificially by hanging sprays of the male flowers in the branches of the fruit-bearing trees. There are no imported trees bearing in Hawaii, and although there are many date trees in Honolulu, artificial pollination would doubtless greatly increase the yield and the quality of the fruit.

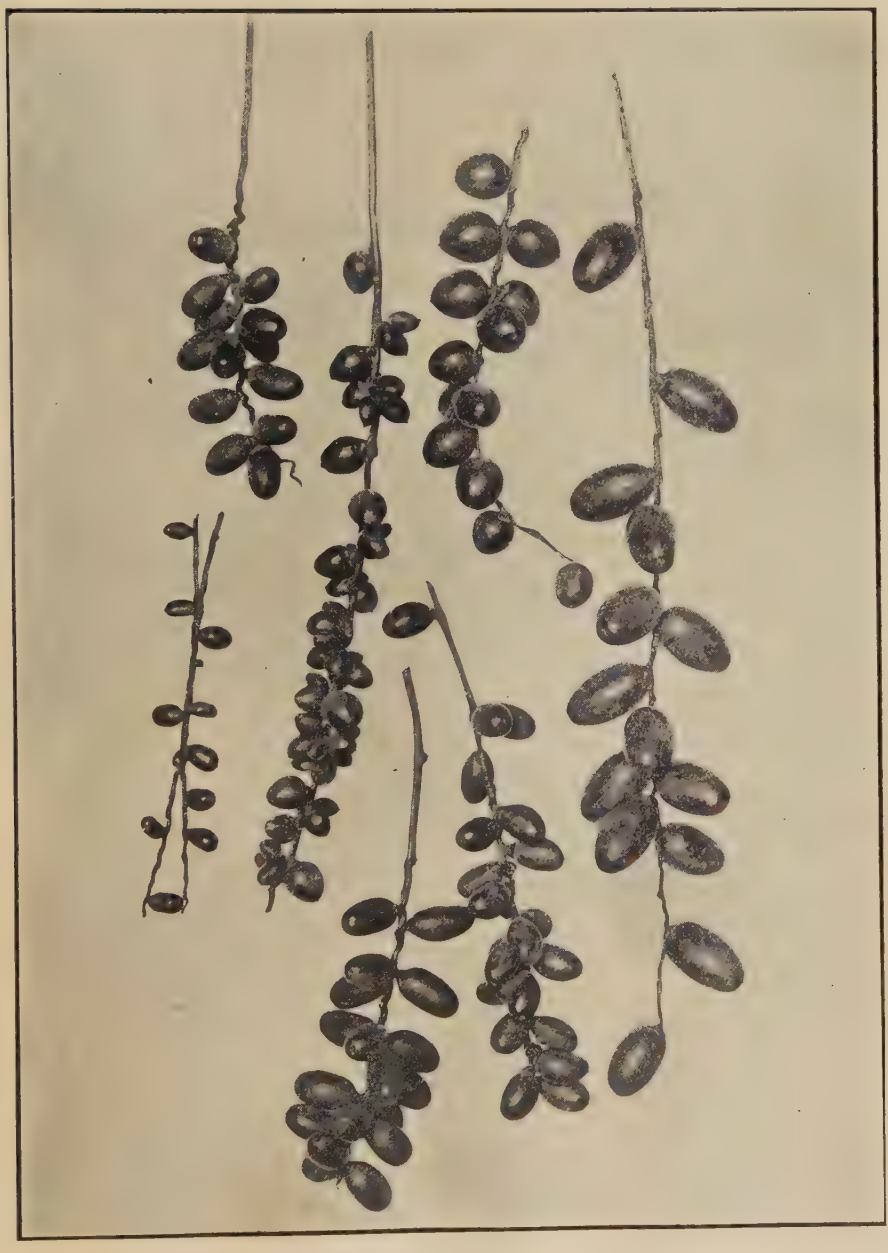

PLATE CX.—*The Date Palm.*
One half natural size.

G. P. W. Collection. PLATE CXI

Phoenix dactylifera.

DATE (red and yellow variety).

The accompanying cut shows fruit from two of the best date trees in Honolulu, and it is curious to note that both of them were grown from seeds taken from packages of dried dates purchased from a local grocer.

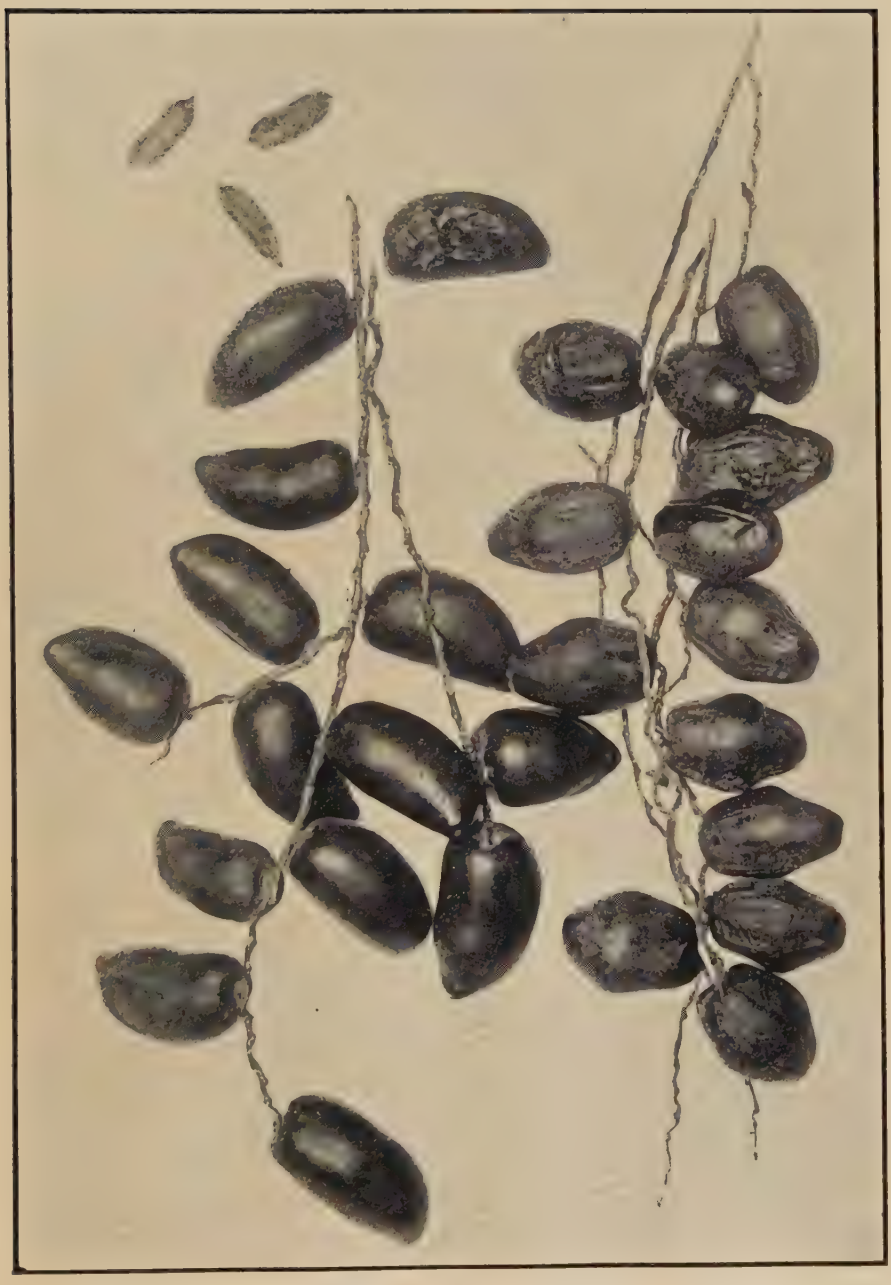

PLATE CXI.—*Date* (*red and yellow var.*)
One third natural size.

G. P. W. Collection. PLATE CXII

Acrocomia sp.

This interesting palm is seldom seen in Hawaii; there being but two specimens of its kind that have produced fruit in Honolulu. Its stem is capitately thickened at the persistent bases of the armed petioles. The glaucous leaves are pari-pinnate with narrow, lanceolate, accuminate segments, having a prominent mid-rib.

The inflorescence is simple and branching. The fruit is arranged similar to that of Cocos, each about three-fourths of an inch in diameter, sub-globose with a pointed apex. When ripe, it is a bright yellow, and its juicy, edible pulp has the flavor of apricots.

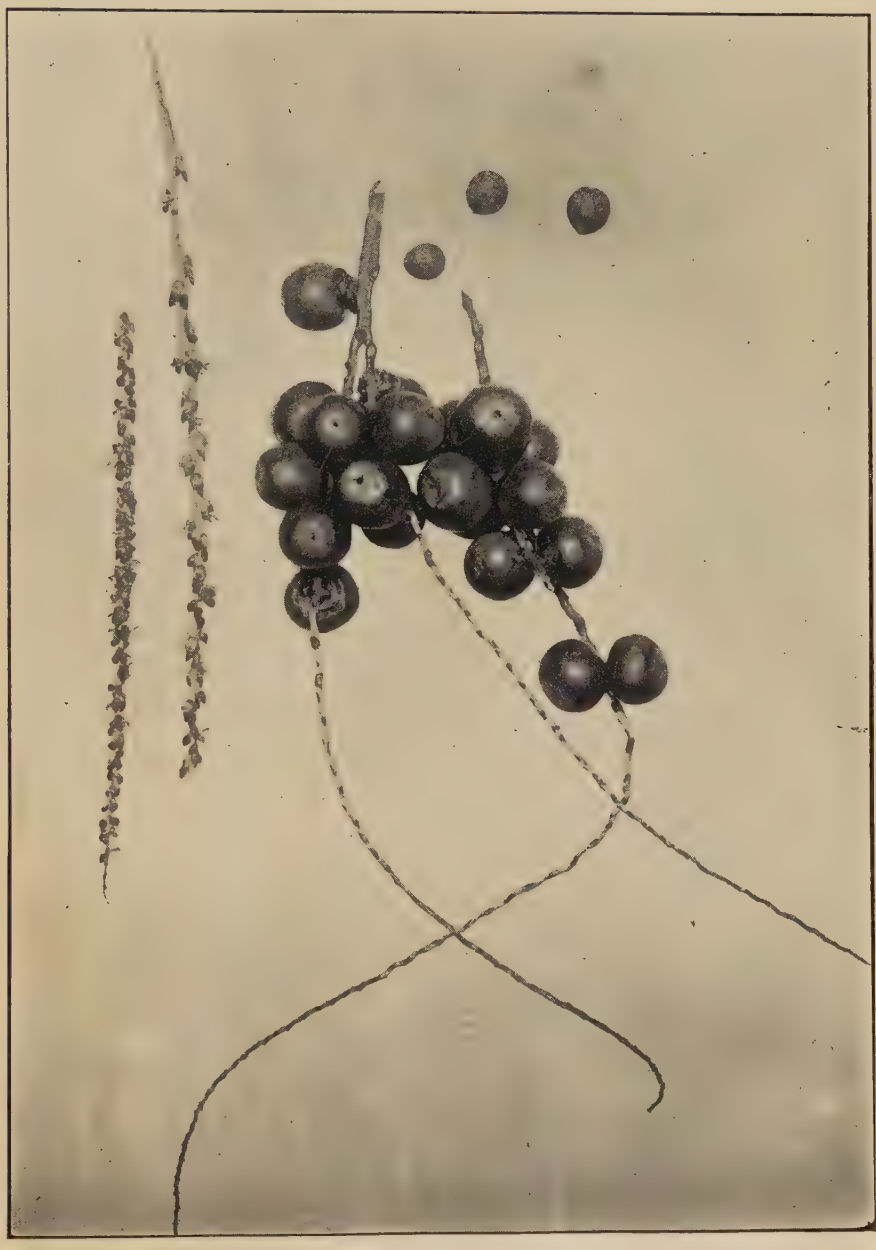

PLATE CXII.—*Acrocomia sp.*
One half natural size.

G. P. W. Collection. PLATE CXIII

Cocos nucifera.

COCOANUT PALM.

"NIU."

The original home of this widely-diffused tree is not positively known. Some writers say it is indigenous to the islands of the Indian Ocean; others show that in all probability it is of American origin. On account of its buoyant husk and impervious shell, it was enabled to drift across the oceans without losing its germinating power, and in this manner was widely dispersed. It is strictly a tropical plant, and grows naturally on the seashore, or in its immediate vicinity.

It has pinnate leaves about 12 to 18 feet long, and the inflorescense first appears in a cylindrical sheath, which splits lengthwise, exposing long sprays of male flowers, and near the base generally one female flower, which is much larger, and eventually develops into a fruit. The picture shows both forms of flowers, as well as a young nut, and also a mature cocoanut. Propagation is by means of the nut alone, which must be thoroughly ripe before planting. The outer husk must be left on, germination taking place at the largest eye; sometimes two eyes may sprout, and twin trees grow from these. Many varieties have been imported from islands of the Pacific, Ceylon, West Indies, and Central America. The cocoanut is not raised in Hawaii for commercial purposes.

PLATE CXIII.—*Cocoanut Palm*—"*Niu.*"

One half natural size.

G. P. W. Collection. PLATE CXIV

Cordia colloccoca.

CLAMMY CHERRY.

This low tree, with its spreading branches, is a native of the West Indies, and is rarely met with in these Islands; there being but two trees of its kind known to me, one growing at the Old Plantation, Honolulu, the other at Honouliuli Ranch, Oahu. The whitish branches are very brittle. The leaves are obovate, oblong, glabrous above and shiny beneath. The subsessile flowers are whiteish-purple. The fruit, which is half inch in diameter, is bluntly pointed and smooth. The fleshy pulp is sticky, and adheres to the single seed. This plant may be grown from seeds and from cuttings.

PLATE CXIV.—*Clammy Cherry.*
One half natural size.

G. P. W. Collection. PLATE CXV

Flacourtia cataphracta.

This tree, which is a native of the Malay Islands and China, was introduced to Hawaii by Mr. Albert Jaeger. There is but one tree which has borne fruit; this is growing at the Old Plantation, Honolulu, Oahu. The tree, which is about 25 feet high, has dense foliage; the leaves are small, oblong, lanceolate, glabrous, having short petioles. Flowers very small, dioceous; the fruit about the size of a common grape, is purple when ripe, and has a pleasant sub-acid flavor. It contains a few flatish seeds.

PLATE CXV.—*Flacourtia cataphracta.*
One half natural size.

G. P. W. Collection. PLATE CXVI

Atalantia buxifolia.

This small tree of dwarfish habit is from tropical Asia. It is closely related to the orange, and has large thorns. Its simple leaves are alternate, coriaceous, emarginate, and from 1 to 1½ inches in length. The petioles are short. The small, solitary flowers have five petals. The berry is globose and three-quarters of an inch in diameter. When ripe, it is a shiny black, and has a thick skin. The pulp has somewhat the flavor of a lime, and the seeds are generally 1 to 5 in number. The only specimens of this tree in Hawaii are growing in the garden of Mrs. Foster; they, presumably, were introduced by Dr. Hillebrand, as these gardens formerly belonged to him.

PLATE CXVI.—*Atalantia buxifolia.*
One half natural size.

G. P. W. Collection. PLATE CXVII

Bumelia sp.

This large shrub is a native of India. Its alternate, entire, obovate leaves have short petioles; they are glabrous and are about 4 to 8 inches in length. The small flowers are light pink. The small, globose fruits grow in bunches; these are purple when ripe, but are not edible. The only tree of its kind in Honolulue is growing in the grounds of the Queen's Hospital.

PLATE CXVII.—*Bumelia sp.*
Natural size.

G. P. W. Collection. PLATE CXVIII

Ochrosia elliptica.

This plant grows in the Pacific Islands, Malay Peninsula, Ceylon, and Australia; and on account of its handsome scarlet fruit is cultivated as an ornament, as the fruit is not edible. The tree is a small evergreen, having alternate, glabrous, coriaceous leaves which are crowded at the ends of the stout branches. The small, white flowers have five petals. The fruit consists usually of two, rarely one, spreading scarlet drupes, each containing a large seed. The first specimen of its kind in Hawaii was planted at the Government Nursery, Honolulu, where is is still growing.

PLATE CXVIII.—*Ochrosia elliptica.*
One half natural size.

G. P. W. Collection. PLATE CXIX

Ananas sativus.

PINEAPPLE.

This variety of the pineapple plant was grown at an early date in these Islands, and until the new and spineless forms were introduced was the only quality offered in the fruit markets. It is now cultivated but little, and is often found growing wild. The rosette at the head of the fleshy fruit has numerous thorny leaves. The fruit is much smaller than those of the thornless varieties, but it has a very sweet flavor.

PLATE CXIX.—*Pine apple.*

One half natural size.

G. P. W. Collection. PLATE CXX.

Opuntia Tuna.

PRICKLY PEAR—"PANINI."

This erect, wide-spreading plant was early introduced to these Islands from Mexico. It thrives well in arid lands, and in times of drought its succulent, fleshy leaves and juicy fruit are eaten by cattle. The plants, when old, become hard and woody, having many stout spines. The large flowers are reddish-yellow, and the obovate, truncate fruit is a purplish-red, having a thick fibrous skin, which is covered with fine bristles. The edible pulp is reddish-purple and contains numerous seeds.

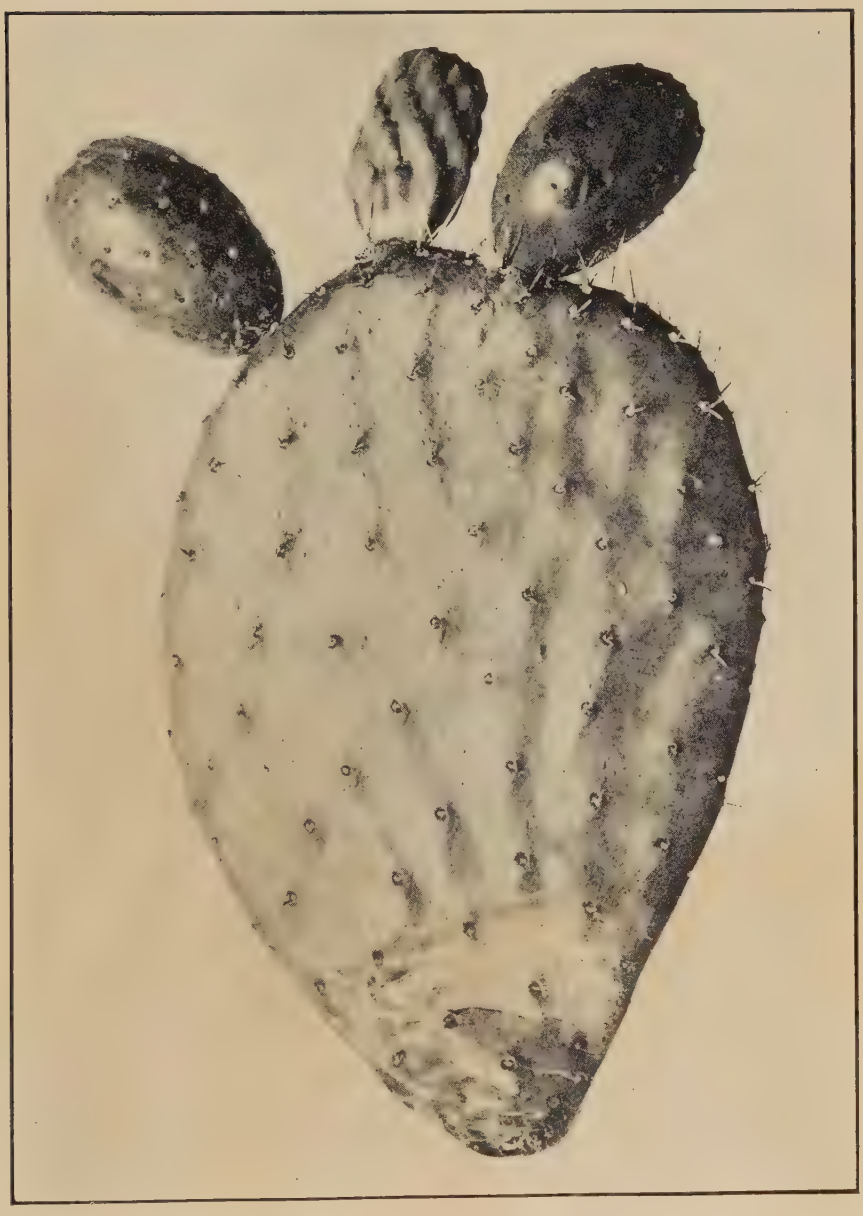

PLATE CXX.—*Prickly Pear—"Panini."*
One half natural size.

G. P. W. Collection. PLATE CXXI.

Prosopis juliflora.

ALGAROBA—"KIAWE."

The Kiawe deserves a special mention in this book, as it is, in my opinion, one of the most valuable and beautiful trees that grows in the Hawaiian Islands. Perhaps on account of its very general dissemination, and because of the ease with which it spreads spontaneously, even in the driest districts, it has received less consideration than has been accorded to other plants more difficult of propagation.

The Kiawe is the foundation of all the beauty of our lowlands, and provides a delicate background for other plants. Under favorable circumstances, it reaches to a height of 50 feet. It has wide-spreading branches and delicate-green foliage. The flowers yield a delicious honey, and the seed-pods furnish a valuable fodder, and, finally, when the tree is cut down, its wood makes the very best of fuel. The Algaroba is a native of Central and South America. Ordinarily it is a moderate-sized tree of quick and easy growth. Its branches in most cases are covered with stout, cylindrical, axillary spines, and in other cases they are unarmed.

The abruptly bi-pinnate leaves have from 6 to 30 pairs of linear leaflets about one-fourth to one inch in length. The small, pale-yellow flowers come in cylindrical spikes. The straight or sickle-shaped seed-pod is sweet, and is eaten by stock. Propagation is by seed.

The first Algaroba tree of Hawaii was brought to Honolulu in 1828 by Father Bachelot, founder of the Roman Catholic Mission in the Islands. It was planted in the Mission garden, where the venerable tree is standing today.

PLATE CXXI.—*Algaroba*—"*Kiawe.*"

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